Master Thesis

---- How HRM, KM and Innovation link in High-Tech company

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Preface

This thesis is the final project for ending my two years master study. As a MOT student, within two years I have primarily master knowledge about the companies’ organizational structures, strategies and kinds of management models etc. Two years study provides me an overall insight about how the company works and how it makes the strategies in order to compete in the market. During the studies, I am interested in HRM and KM fields most, and always concern about how the High-tech company organizes and manages the employees, and how it utilizes their knowledge to gain the most profits. Hence, I choose the topic about “How HRM, KM and innovation link in high-tech company” as my final research thesis, which can offer me an opportunity to systemically learn the internal links among these three elements. I hope this thesis can answer this question and end my study successfully.

During two years study in the Netherlands, I have not only acquired knowledge of management of technology, but also learned the way to think and the way to learn. I really enjoy my life here, which will be my best study experience in my whole life.

Upon the closing of this project, I would like to take this chance to thank both of supervisors, friends and family who have given me tremendous support in the past two years of studying abroad, and especially during the period of this thesis project.

I would like to thank my first supervisor, Verburg, who is a patient, nice professor to me in the last half year. In spite of his very tight schedule, he still managed to give me sufficient direction on a weekly basis. The accomplishment of final phase of this thesis is not due small part to his contribution.

I would like to thank my second supervisor, Dekker, who gave me valuable opinions about my thesis modification.

25 September 2005, delft
Gaoshu
Abstract:

This thesis focuses on exploring the links between human resource management (HRM) and innovation, human resource management (HRM) and knowledge management (KM), knowledge management and innovation in high-tech company. Reviewing the researches in these fields, different definitions of HRM, KM and innovation from different perspectives are found, through summarizing these definitions, I concluded my adopted ones. The theoretical links between each two of them are described and explained to review the pervious works from different researchers. And according to these theoretical links, the refined model is built and illustrated by the use of HP case. By doing the case studies in SKF and Ordina and analyzing them, based on the refined model, this thesis comes up the final model representing the relationships among these three research objects. Finally, this thesis offers some recommendations for high-tech company in the future management and gives the final conclusion.

Key words:
links, Human resource management (HRM), knowledge management (KM), Innovation
Chapter One

Introduction

The goal of this thesis is to provide insight in the links between Human Resource Management (HRM) and innovation, Knowledge Management (KM) and innovation, and HRM and KM. I will explore those links through a literature study as well as through some case studies at companies to provide relevant input from practice as well. The cases will focus primarily on how the company under study actually organizes both the HRM and KM function in relation to innovation as an important organizational outcome. With this thesis I aim to provide insight in the nature of the relationships between KM, HRM and innovation by building a model on basis of the literature study and the case research.

This thesis is divided in six chapters and deals with two main parts: theory and practice. The first four chapters are parts of the theoretical overview. Chapter one consists of the research background and research profile. Chapter two, three, and four respectively describe the theoretical links between KM and innovation, HRM and innovation, and KM and HRM. Chapter five builds research methodology and describes three cases. Chapter six is dedicated to analyzing three cases and according to the analysis, refines the pervious research model, and then makes the final conclusions of this thesis, as well as the further discussion.

1.1 Research Background

The 21st century can be characterized by more intensive competition in the market. Under the pressure of intensified competition, many managers of high technology companies are probably forced to gain the most benefits with the least total costs. The appearance of the new term, knowledge economy, represents that the society has entered a new era that makes use of knowledge to create and increase profits. Knowledge economy is marked by such major developing trends, such as pervasive computing, mass customization, continuous learning, globalization competition, collaborative partnering and virtual enterprise. Holsapplel and Jones (2005) define a knowledge economy, as an economy in which value flows from the technology and practices used to harness an organization’s knowledge resource and knowledge-processing skills. In short, knowledge economy is a knowledge-driven economy, in which the generation and exploitation of knowledge play the predominant part in the creation of values. From this point of view, knowledge has become the key resource to create values and increase profit for the companies.

In the competition, the company aims to produce new, intelligent and not easy to be imitated products. Therefore, innovation has become important means of competition for many high-tech companies and been invested since the last few years. It is at the heart of economic growth and development. But what do they mean when they aim for innovation? Below, I will give some definitions.
1.1.1 The Definition of innovation

Normally, innovation can be seen as a process that can lead to improve engineering, technology, methods, states of mind and organization. During this process, the important role of innovation is to establish as necessary ingredient for firms in order to remain competitive or pursue long-term advantages (Hamel and Roberts, 1998). Different researchers with different perspectives give various definitions of innovation.

<table>
<thead>
<tr>
<th>Author/s</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>West and Farr</td>
<td>“Intentional introduction and application…..of ideas, process, products and designed to significantly benefit the group, organization or wider society” And they view innovation as a cyclic loop, consisting of four distinct phases, including recognition, initiation, implementation and stabilization. If recognition is seen as the start point of loop, then it means that to make a new thing, first of all, creative ideas needs to be recognized and noticed. After the creative ideas are adopted, inventor should set about doing the research, in this phase, the innovation process starts to become serious and tries to be driven into business way. During the phase of implementation, the creative ideas are put into practice to produce the prototype, and implement the first market hit. In the stabilization phase, the innovation has become the real products with mass production in the market. Then, the other new innovation loop begins with the recognition of creative ideas.</td>
</tr>
<tr>
<td>Carnegie and Butlin (1993, p.25)</td>
<td>“something that is new or improved done by an enterprise to create significantly added value either directly for the enterprise or directly for its customer”</td>
</tr>
<tr>
<td>Livingstone et al. (1998,p.48)</td>
<td>“new products or processes that increase value, including anything from patents and newly developed products to creative uses of information and effective human resource management systems”</td>
</tr>
<tr>
<td>Williams(1999)</td>
<td>Innovation is the implementation of both discoveries and inventions, and the process by which new outcomes, whether products, systems or processes, come into being.</td>
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</tbody>
</table>

Table 1: representative sample of innovation definition

Summarizing the different definitions of innovation, the adopted one for me is to define innovation as a process, changing creative ideas to real products by knowledge flows, aiming to gain the profits from the market, which can be consisted of four phases including recognition, initiation, implementation and stabilization.

From the definition that has been adopted above in this thesis, it is obvious that innovation is one of the sources of competitive advantages, and plays an important role of creating and adding profits for the companies. It can be seen as a process, starting with people’s creative ideas or their accumulated professional knowledge in their daily working lives. In high-tech companies, they contribute to the technology field, and aim at utilizing the professional technology knowledge to produce the new products, meeting
the changes and the consumers’ requirements in the market. However, the quality and quantity of innovation are required to be taken into account as well. Currently, some researches (Meadam, 2000; Scarbrough, 2003) start to consider managing the links among knowledge, employees and innovation, and are trying to integrate them to achieve gaining the company’s better performances. For instance, Rodney Meadam (2000) tried to establish a knowledge management model in which the principles of innovation are incorporated. Other opinion considers innovation as the consequence of knowledge or the medium of knowledge (Scarbrough, 2003). It seems that they want to achieve the aim of improve or influence innovative performance by managing employees and their knowledge. However, they do not exactly know how HRM, KM and innovation are linked in practice and deal with these links?

This thesis will explore the theoretical links between HRM and KM, KM and innovation, and HRM and innovation, and how the companies organize these links in practice.

1.2 Research questions

The focus of this thesis is on the research in the fields of the interactions between HRM and KM, KM and innovation, and HRM and innovation. The basic theoretical study will comprise of an overview of the links among these three elements; furthermore, case studies will provide more detailed information on how the companies organize these links.

The central question is, therefore:

What are the theoretical links between HRM and KM, KM and innovation, and HRM and innovation and how do the companies organize these links in practice?

Relevant questions to be researched:

1. How are KM and innovation theoretically linked
2. How are HRM and innovation theoretically linked
3. How are HRM and KM theoretically linked
4. How are KM and HRM, KM and innovation, HRM and innovation organized in practice
5. Does theory meet practice

1.3 The Model for thesis research

As a process, innovation utilizes the knowledge flows to change creative ideas to real products, aiming to gain the profits from the market. As Scarbrough (2003) states, innovation can be seen as the consequence of knowledge or the medium of knowledge. Hence, the elementary research model can be built in figure 1.
This elementary research model can be explained:

Innovation in this model can be regarded as the outcome of HRM and KM, and it can be influenced by HRM and KM.

1. KM links with innovation, and influences it
   Innovation is a process of knowledge flow in order to create values for the company. By managing knowledge flow, it must influence the innovation performance.

2. HRM links with innovation, and influences it
   The start point of the innovation process is from creative ideas which are created and carried by people. Hence, by managing people in the company, to some extent, it could influence the innovation performance.

3. HRM and KM are linked with each other
   As a main body of carrying knowledge, people can also be seen as a barrier of managing the knowledge. In some ways, HRM can overcome the barrier to achieve the better KM performance. Hence, HRM and KM are links in those certain ways.

4. The integration of HRM and KM can influence innovation
   HRM and KM probably could be integrated in a certain way, such as models and systems. And this integrated, new management model or system can influence innovation.
Chapter Two

KM and Innovation

This chapter will focus on how KM and innovation are theoretically linked. The definitions of knowledge and knowledge management are introduced in brief. And then the theoretical links between KM and innovation will be explored from literature research.

2.1 Definition of Knowledge

About the definitions of knowledge, different researchers give their own opinions from their own understanding and perspectives. The most accepted definition of knowledge is quoted from Yahya and Goh’s research literature (2002), which defines knowledge as a “fluid mix of framed experiences, values, contextual information and expert insight that provides a framework for evaluating and incorporating new knowledge and information” (p.460). In a practical sense, knowledge can also be considered as ‘actionable information’. It allows the people to make better decisions and provide an effective input to create the new products. Knowledge can be existed not only in the form of documents, but also in the form of people’s thoughts in mind. From Polanyi (1967) perspective, knowledge “arising from the data and information has taken the form of a logical behaviorist perspective and can be distinguished along the continuum of ‘knowing how’ and ‘knowing that’” (Jashapara, 2004, p 48.). Nonaka (1994) makes distinction between tacit and explicit knowledge based on Polanyi original categories. He develops a hypothesis for the four modes of knowledge conversion, showed in figure 2.
Hence, from Nonaka perspective, knowledge exists along a continuum between tacit knowledge (know how) and explicit knowledge (know what). But what are exactly means of tacit knowledge and explicit knowledge?

2.1.1 Tacit and Explicit Knowledge

In the last decade, knowledge has emerged as one of the most important and valuable organizational assets to drive organizational survival and success. However, managing the knowledge requires the different management approaches due to its different forms of existence (tacit and explicit). How to distinguish tacit and explicit knowledge and according to their characteristics to manage them are still problems to face.

Tacit Knowledge

The term of tacit knowledge has been used to refer to knowledge that has not been formalized or made explicit (Zander and Zander, 1993), as well as to knowledge that can not be formalized (Popper, 1972; Nonaka and Takeuchi, 1995; Howells, 1996; Hansen, Nohria and Tierney, 1999). Hence tacit knowledge also can be emerged that knowledge that has not yet been formalized and knowledge that can’t be formalized. Knowledge that has not yet been formalized implies that it can be formalized at some point in time.

Skills, competences, capacities, know-how, technology and experience can not be completely formalized as the documents. For example, the master craftsman who is often unable to articulate what he or she knows about their skills and crafts which are captured in concrete “know-how”. This know-how knowledge can not always be formalized, which belongs to the first existence form (knowledge that has not been formalized and knowledge that can’t be formalized). Nonaka and Takeuchi (1995) and Polanyi (1966)
consider skills, competences etc, and this kind of knowledge as one of segment of tacit knowledge-technical dimension. The other dimension is cognitive dimension. It encompasses “mental models” (Johnson-Laird, 1983), such as paradigms, perspectives, beliefs, images of reality and vision of the future, which shape the individual’s perception of the world. Normally, in this dimension, most knowledge can’t be formalized.

**Explicit Knowledge**

Explicit knowledge refers to knowledge that is transmittable in some systemic language — such as words, numbers, and diagrams or models (Polany, 1966). On the other words, explicit knowledge is knowledge articulating and codifying in handbooks, computer programs, databases and training tools, among other elements (Patricia, 2004). It is easily transmitted orally and in written or electronic form. It can also easily be manipulated and stored in various databases and repositories. People can acquire explicit knowledge by actively searching for it through education and repositories.

The following table can show the main differences between tacit knowledge and explicit knowledge.

<table>
<thead>
<tr>
<th>Tacit knowledge (subjective)</th>
<th>Explicit knowledge (objective)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of experience (body)</td>
<td>Knowledge of rationality (mind)</td>
</tr>
<tr>
<td>Simultaneous knowledge (here and now )</td>
<td>Sequential knowledge (there and then )</td>
</tr>
<tr>
<td>Analog knowledge (practice )</td>
<td>Digital knowledge (theory)</td>
</tr>
</tbody>
</table>

Table 2: The differences of two types of knowledge (source: Nonaka and Takeuchi, 1995)

Managers who invest much energy in managing knowledge will make different strategies according to the characteristics of tacit and explicit knowledge. For instance, Managers might stimulate the employees to share the tacit knowledge by dialogues or contacting with each others. They also might build ICT systems (including intranet and E-learning system etc.) for the employees to acquire and update knowledge by themselves. However, during the process of managing knowledge, managers will also meet many barriers from different aspects, some of which can be removed easily, while some can not.

**2.2 Managing Knowledge and Barriers**

Considering the differences of defining knowledge, a variety of measures and models for valuing knowledge and knowledge management initiative and endless variety of organizational structures, cultures and formative contexts, as well as numerous motivations( Nada, Alexander and Andrew, 2001), it is no surprise that there are a variety of barriers needed to be removed for its management. In 1998, Tcisks identified three
major broad categories of knowledge barriers across Europe, namely, people, management, structure.

People:
- Inertia to change
- Too busy, no time to learn
- No discipline to act
- Motivation
- Transferring knowledge to new people
- Teaching older employees new ideas

Management:
- The fear of giving up power
- The difficulties of passing on power
- Challenging traditional company style
- Imposed constraints
- Lack of understanding about formal approaches

Structure:
- Inflexible company structures
- Fragmented organizations
- Functional ‘silos’
- Failure to invest in systems

Most of these barriers need to be removed in order to achieve better management performance. This thesis will examine and explain the barriers from people category by focusing on doing researches in HRM field. The barriers of management and structure are not related with the questions required to be answered, so they can be laid aside and discussed in another paper.

2.3 The Definition of Knowledge Management

Managers should cultivate an environment that can create rich opportunities for re-evaluating the existing knowledge and generating new knowledge (Scharge, 1997). This environment prepares the launch of the relevant strategies and systems for managing knowledge. Once the organization has such an environment, knowledge will become a source of long-term competitive advantages. Under this environment, managers clearly recognize that they need to develop new strategies to manage these intangible resources. In other words, a new framework or strategy for managing every activity of knowledge process and a new way of measuring the intellectual assets are required. Therefore, the new framework or strategy appears in the high-tech company’s management system, which is known as knowledge management. Defining the concept of knowledge management is difficult, as different perspectives can yield different dimensions and meaning. These perspectives can be from human resource process, information system, strategy and integration one (information systems and human resource).
Malhotra (1998, p58) ‘Knowledge management embodies organizational processes that seek synergistic combination of data and information processing capacity of information technologies, and the creative and innovative capacity of human beings’ Integration (information system and human resource)

Williams (1999, p.34) ‘Knowledge management is the process by which the organization generates wealth from its intellectual or knowledge-based assets’ strategy

Bukowitz and Empirical (2000) a process of leveraging and articulating skills and expertise of employees, supported by information technology Integration (information systems and human resource)

Bhatt (2001) a process of knowledge creation, validation, presentation, distribution and application Human resource process

Jashapara, (2004, p12) ‘the effective learning processes associated with exploration, exploitation and sharing of knowledge(tacit and explicit) that use appropriate technology and cultural environments to enhance an organizations intellectual capital and performance’ interdisciplinary (human resource process, strategy, information systems)

Table 2: representative sample of knowledge management definitions

Although the above definitions from different researchers with different perspectives, they have a agreement that knowledge management can be treated as a process of leveraging of knowledge as the means of achieving innovation in process and products, the increase of profit, and organizational adaptation to the market. During this process, knowledge management might be divided into many activities, such as knowledge creation /generation, knowledge identification, knowledge development, knowledge store, knowledge distribution and knowledge sharing, knowledge learning and knowledge application / evaluation etc. Some of the definitions stated above are defined KM from information technology perspective, which implies KM might have close relationships with information communication technology management. Currently, during the process of managing knowledge, the managers usually utilize ICT to help the implementation of knowledge storage and knowledge transfer. For example, knowledge sharing and knowledge transfer heavily depends on the information communication technology in the multi-national high-tech company due to the different locations. To some extent, many managers might confuse ICT management with knowledge management, they probably think knowledge management is a part of ICT management, or ICT management can execute all the activities of knowledge management. Both of them are wrong opinions and wrong directions to manage the knowledge. The role of ICT management is only to support KM, and three main reasons are:

Firstly, one of aims of ICT systems is to store the formalized knowledge. The purpose for storing knowledge is to avoid its loss, once the employees leave the company for some reasons. Secondly, due to many internal and external reasons, many middle-size
companies are forced to globalize, and to establish the international business (Briscoe & Schuler 2004), therefore, transferring knowledge among the different countries becomes one of the main problems. With the support of some certain ICT systems (such as intranet), the company not only can solve this problem much easier, but also can improve the efficiency and lower its total cost in the international competitive environment. Thirdly, the use of ICT systems is also an approach to share and acquire knowledge inside the company. For example, the employees can find the right people to ask for sharing their own experiences or professional knowledge from the yellow page. Forum offers a free and opening platform for employees to communicate their ideas and share their questions and answers.

ICT can support KM to implement some activities, such as knowledge store, knowledge transference and parts of knowledge acquire within the organization. However, it only plays supportive role for KM, and it can not implement all the procedure of KM.

2.4 The Theoretical links between KM and Innovation

Since knowledge represents a realm far deeper than simply that of data, information and conventional logic; indeed, the power of knowledge lies in its subjectivity, underlying values and assumptions that underpin the learning process (Nonaka and Takeuchi, 1995). And according to the most definitions of innovation mentioned in the first chapter, it is not difficult to recognize that knowledge can be seen as one of its inputs. Supposing that by managing knowledge can influence innovation process, there must some links between KM and innovation. In the following paragraphs, the theoretical links between KM and innovation will be explored.

1. **Knowledge management can be regarded as an antecedent of innovation**
   The roles of innovation include the search for and the discovery, experimentation, and development of new technologies, new produces and service, new production processes, and new organizational structures (Carineiro, 2000). To achieve better implementation, innovation needs to combine the high level of individual knowledge and on its technological basis. Hence, some activities of KM (such as knowledge creation, knowledge development and knowledge application) can be considered to prepare the foundation of developing innovation. For instance, knowledge creation and knowledge development establish the theoretical foundation for innovation. And knowledge application can be seen as the preparation of practicing innovative ideas. Many researchers (Carneiro, 2000; Dove, 1999) have concluded that KM is an antecedent of innovation. Furthermore, in 2004, Gloet and Terziovski confirmed that the process of innovation heavily depends on knowledge and the management of knowledge, and they also stated that employees should be an essential element of running KM and innovation process in any type of business.

2. **Knowledge management and innovation are found on the same elements, employees’ experience and knowledge facts**
   Coombs and Hull (1998) state that knowledge creation and organizational learning, both of which are core concepts in the field of knowledge management, are closely
linked to the innovativeness of organization. Hence they offer a tool for auditing innovation through an evaluation, called knowledge management practice. They regard knowledge management practice as routines within the firm, and propose that knowledge management is best studied as a set of specific practices. They build this tool by establishing how the R&D departments of selected high-tech companies actually support their innovation management by knowledge management. During the process of audit, they suppose that the connection between KM and innovation is based on the past employees’ experiences and knowledge facts. By testing this hypothesis, the results are positive and imply that KM and the innovation process are found on the same elements: employees’ experiences and knowledge facts.

3. **Knowledge management can influence types of innovation**
   Innovation in Jenny’s literature (2002) is divided into two types, radical innovation and incremental innovation. Most innovations are incremental and will present themselves as either line extensions or modifications of existing products (Jenny, 2002). Incremental innovations are usually classified as market-pull innovation, since most ideas come from the market place. By contrast, radical innovations always reinvent the existing skills and knowledge and often require different management practices (O’Connor, 1998). Radical innovations are usually classified as technology-push innovations, and they can put the business at risk due to many uncertainties in the market.

Jenny in her research examined the links between knowledge management and types of innovation. On basis of an overview the previous literatures in this field, she puts forward several hypotheses. And then she tested these hypotheses by analyzing the data from 433 New Zealand companies. Finally, she concluded that some knowledge management practices were related with any innovation type. These KM practices include knowledge acquisition, knowledge distribution and responsiveness of knowledge. For instance, she confirms that incremental innovation does not come from firms that respond to knowledge about the market or had an effective marketing function, but for firms that are sensitive to information about changes in the marketplace and responded to knowledge about technology. In short, the successful incremental innovation depends on the management of information about changes and knowledge about technology.

4. **The activities of KM can influence the activities of innovation**
   Leonard (1995) and Dougherty (1996) present a framework of innovation that focus on the concept of innovation as activity. I quote the framework here to illustrate to these activities.
Figure 2: the framework of innovation activities and KM activities and their interaction (Dougherty, 1996, p 430)

From the figure, both of the researchers identify the innovation process as various activities, including creative, shared problem solving, market-technology linking, experimenting and prototyping, monitoring and evaluation, and commitment and development. By doing more research, Leonard and Dougherty conclude that the activities of KM and the innovation process have close links, and the activities of KM can influence the activities of innovation. For example, shared creative problem solving is likely to be primarily dependent upon knowledge creation and knowledge sharing, and perhaps also, to a lesser degree, to knowledge application and retention. The goals of innovation are to create the company’s competitive advantages and meet the consumers’ requirements in the long run. These two problems will be faced by all the companies sooner or later. One approach to solving these problems can use the new knowledge to create totally new products or new methods by the generation of new knowledge in order to meet the future market. During this process, knowledge sharing can speed up knowledge exchanges, knowledge flow and knowledge update inside the company, which prepares the theoretical foundation for looking for new solutions. Normally, one innovation activity will relate to more than one knowledge process. And even if the same knowledge process with the same label, it has different goals for the innovation process. Knowledge sharing for the purpose of creative problem solving is likely to be quite different from knowledge sharing for the purpose of learning about new technologies from outside the firm.

2.5 Conclusion

To conclude the theoretical links described above between KM and innovation, the links can be illustrated as following.
As an antecedent, KM prepares the foundations for innovation implementation, including theoretical foundations and practical foundations. In ready environment, innovation can be stimulated and developed much easier. And to some extent, both of KM and innovation are developed, basing on the same elements, employees’ experiences and knowledge facts. When both of KM and innovation are regarded as the concepts of various activities, these activities are interacted with each other. Moreover, one innovation activity can be influenced by more than one KM activities, and same KM activity can influence different innovation activities with different goals. Due to the different characteristics of types of innovation, some KM practices can influence the types of innovation (radical innovation or incremental innovation).
Chapter Three
HRM and Innovation

This chapter will focus on how HRM and innovation are theoretically linked. As the previous chapter, the introduction of basic definitions of HRM will be given firstly, and then the exploration of theoretical links between them will be elaborated as well.

3.1 Definition of Human Resource Management

Employees are the main body of tangible assets and their knowledge are intangible assets of high-tech company. One of the aims to manage employees is to achieve a better KM performance (Kamoche and Mueller, 1998). They explain that the company needs to retain the personnel, and build their expertise into the organizational routines by learning processes, and establish mechanisms for the distribution of benefits arising from the utilization of this expertise. During these processes HR managers need new strategies or frameworks to leverage the employees and their knowledge in order to achieve the final goals. Hence, human resource management is defined as ‘a strategic approach to managing employment relations which emphasizes that leveraging people’s capabilities is critical to achieving sustainable competitive advantage, this being achieved through a distinctive set of integrated employment policies, programmes and practices’ (Bratton and Gold, 2003, P.3). From this point of view, people’s capabilities could include the capability of individual improvement of knowledge acquirement and update, which can result in the improvement of individual’s innovativeness. Therefore, HRM is an approach for achieving competitive advantage by leveraging people’s capabilities in knowledge field. The keys among them are deciding what staff the company needs and whether to use independent contractors or hire employees to fill these needs, recruiting and training the best employees, ensuring they are high performers, dealing with performance issues and regulations. The activities also include managing the approach to employee benefits and compensation, employee records and personnel policies.

3.2 Creativity as a medium between HRM and Innovation

As mentioned in the section of innovation definition, as a process, the start point of innovation can be regarded as the creative ideas, namely, the idea creation. The process of generating ideas is a useful approach to view creativity (David Gurteen, 1998). Creativity is most often defined as the production of novel and useful ideas (Todd Dewett 2004). This definition’s core is oriented by two criteria: novelty and utility (Cummings and Oldham, 1997). Novelty implies that newness or originality. And utility implies that
an idea can be reasonable used to create some value and relevant to the goals of the organization.

Innovation is a process to implement these creative ideas, which means that creativity is about the generation of ideas, and innovation is about putting them into action. Thus, the generation of ideas is a crucial part of the innovation process. It is not surprised that creativity is the foundation and nourishment of innovation. Creativity is not just a natural talent, it is also a skill that everyone can develop and learn (Edward de Bono, 1997). If creativity can be improved, then more creative ideas are likely to be put into action, accordingly, the organization’s innovation performance also can be improved. The question is how to stimulate the employees’ creativity.

1. **Reward management**
   As mentioned, Adair (1990) offers an advice that the content of reward packages can stimulate the employees’ creativities. These contents might include one or all of the following. First, stimulating contacts through colleagues are able to provide intellectual stimulation. Encouraging the communication and contacts through all over the colleagues can open employees’ minds and come up with different ideas, stimulate their creativities in their own working fields or the other fields. Second, the encouragement of creative individuals is to take calculated risks since they respond well to this environment. It implies that the employees’ creativities need to be measured after they make the responds. Third, the organization should provide the freedom to employees to work in the broad areas the interest them, provide the organization’s mission is properly focused and communicated. The organization should provide the freedom to the employees to do their interesting research, at the same time, the organization also can provide the focused mission, and communicate with employees. Fourthly, recognition since appreciation can be much more important to the individual than money. Except the money issue, all the people hope their works are useful for the companies or for the others, their works can prove their existence in the world. And all the people will be glad to hear the appreciation words from the companies or from the others. These will encourage their passion to focus on thinking differently and doing in innovative ways.

2. **Building the creative team**
   This encouragement is based on the group creativity level. There are also three creativity levels like three learning levels, individual creativity level, group creativity level and organizational creativity level. Through building a creative team, the team leaders can encourage mutual supports between team members, and balance the freedom and responsibility. Knowledge acquirement from different knowledge fields can also stimulate the employees’ creativity in their own fields. At group level, leadership plays a very important role, which is to encourage group support, and manage the creativity in a way rather than leaving employees to swim in the sea.

3. **By training**
   Since creativity can be developed and learned, training can be seen as a core activity for achieving this. The training process can include program identification, setting
objectives, designing and delivering content, getting feedback and evaluating (Ian Roffe, 1999). These training activities offer an opportunity for employees to update and acquire knowledge, communicate with each others, and exchange information with each other. During this process, knowledge becomes the foundation of creativity, and training is a tool to teach people how to be more creative with this knowledge.

4. Evaluating creative performance

‘Positive and negative performance feedbacks are extrinsic consequences for one’s efforts and can undermine one’s sense of self-determination’ (Scott, 2001 p 66). The creative ideas need to be evaluated to see if they are feasibility before put them into practice. However, negative feedback will frustrate the employees’ passions of creativity. Hence, the evaluation of creative performance should be fair and supportive, and probably should provide some useful information. Such feedback provides an opportunity to revise the employees’ creative ideas without making criticism or praise salient.

All the solutions mentioned above are the activities of HRM, which implies that by the use of HRM practices or strategies, creativity can be stimulated. Right HRM practices or strategies can produce more creative ideas, increasing the possibility of turning the ideas into real products. In short, HRM practices and strategies can influence and stimulate innovation through stimulate creativity indirectly. As figure shows:

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| HRM practices and strategies | Creativity | Innovation |
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Figure 3: the relationship between innovation, HRM and creativity

3.3 Diversity as a input for innovation

At group level, the organization can stimulate the employees’ creativity through building the creative teams. Different knowledge sources from different background can stimulate the employees’ rethink the tasks and missions from different perspectives. By this approach to influence innovation is called diversity, and it is not surprised that diversity also needs to be managed in order to achieve the goal of better innovation performance. Summarizing most formal definitions, diversity means ‘embracing the rich tapestry of skills, experiences and ideas that come from the varying backgrounds that society offers today’ (Mike, 2004). Diversity can bring in extra talent, different perspectives, learning, and limitless opportunities for innovation at all levels of organization. The benefits of managing diversity have already found by Mike after he did the 100 case studies in USA. He states that diversity is not just the right thing to do, and it is a long-term strategic business factor that has a significant impact on productivity, workforce motivation and innovation.

In a world of accelerating change, the old solutions may not be appropriate to the new problems. So the company needs employees to challenge the status quo. Diverse
employees can provide new, different points of view. Diverse perspectives can be used to rethink primary tasks, redefine markets, products, mission, vision and values (Mike, 2004). The focus is on what the employees can learn from each other’s viewpoint and experience and how they tap the potential engendered by different backgrounds and variety of opinions and insights. Hence, the question is how the company manages this diversity and make it service innovation.

1. **Recruitment**
   This is direct way to gain the diverse employees from the outside human resource market. Recruiting for diversity can not simply be perceived as successful, once new diverse employees have joined the organization. Organizations need to invest time in understanding these employees’ personal drivers and motivators, which may vary significantly from existing staff. After that, assigning them into mix creative teams to balance skills, knowledge and experiences is an approach to make diversity at group level. Within the groups the employees from different backgrounds can learn and exchange the viewpoints and experiences with each other, rethink the current project together. Finally, these different opinions and ideas are integrated into one, the best one. By recruiting the diverse employees, the organization increases the diversity at group levels.

2. **By setting up a diversity training programme (Mike, 2004)**
   The process of setting up a diversity training programmes depends on the connection between HRM and organization’s current situation. First, HRM managers need to communicate with other project managers what diversity is and what the organization hopes to achieve by managing it more effectively in order to avoid the misunderstood at all levels. To enhance the understanding of diversity, present a clear business case for diversity initiatives and link with changing demographics and social changes will be clear for all the participants. Second, HRM needs to be sure that the participants of diversity training courses include senior and line managers as well as employees from different functions and departments. Through undertaking a diversity audit to assess current diversity levels and issues, this is an example of good practice. The purpose for doing this is to make all the participants understand what the organization’s diversity situation is and if they needs to change it. Third, ask participants for examples from their own experience where they have not been treated fairly or with mutual respect, which will help employees see that diversity is a concept with something in it for them. Finally, the diversity training programme needs to teach the employees to reevaluate the old materials and integrate new ideas from different perspectives with these old materials. Link new learning to the existing experience of the learner. This diversity training programme can enhance the employees’ diversity individually, which means the organization can increase the diversity at individual level.

Diversity offers rich resources of different talents, different perspectives and opportunities for innovation. It can be considered as one of the inputs for innovation, which can help organization more innovative. These two methods of achieving diversity goals at individual and group levels involve HRM practices, hence, it can be summarized
that HRM practices can manage diversity, and influence innovation indirectly. The relationship can be illustrated in following figure.

![Figure 4: the relationship between diversity, HRM and innovation](image)

### 3.4 The theoretical links between HRM and innovation

As Nonaka (1994) and West (1990) state the organizations are able to stimulate and to improve the knowledge of their employees are much more prepared to face today’s rapid changes and to innovate in the domain where they decide to invest and to compete. Managers should recognize that the skills and knowledge of employees and the motivation level make possible creative suggestions, different proposals and research activities to build up innovations. From this point of view, the innovation process starts from these creative ideas and different proposals, and then put into practice. Hence, human factors and, in particular, human resource management, are today considered key elements of successful innovation, since the human element involved in the whole innovation process (Daniel and Raquel, 2005). Considering that HRM determines and modifies, to a large extent, these aptitudes, capacities and attitudes, it seems clear that it becomes a crucial element in the development of innovation activities. Mumford (2002) also confirms that the certain HRM strategies (such as rewarding strategy and performance strategy) can stimulate the nature of creativity, which can enhance the company’s innovative capabilities. Exploring the links between HRM and innovation is as following three points.

1. **HRM practices influence innovation indirectly**

   Different researchers identify HRM practices into different dimensions. For instance, Gupta and Singhal identify HRM practices into five dimensions, human resource planning, performance appraisal, reward, career management, and training. While, Go´mez-Mejía et al. (2004) identify HRM practices as recruitment and selection, training, development internal career opportunity, performance appraisal, compensation and other HRM practices.

   Daniel and Raquel (2005) also formulate propositions about the relationship between innovation and HRM practices. Through testing, the results indicate that in order to affect employees’ creativities and behaviors, and consequently promote company’s innovativeness, companies must develop a bundle of internally consistent HRM practices. And Laursen and Foss (2003) insist that that HRM practices are the most conductive to innovation performance after investigating the links between HRM practice and innovation. They conclude that ‘while the adoption of individual HRM practice may be expected to influence innovation performance positively, the
adoption of a package of complementary HRM practices could be expected to affect innovation performance much more strongly’ (Laursen and Foss, 2003, p. 257). This is an example that HRM practices stimulate innovation by the medium of creativity, influence innovation indirectly.

2. **HRM strategy stimulate innovation indirectly**
   As the start point of innovation, creative ideas can arise from anywhere, at any time, but if managers seek to creative individuals to foster innovation, they should not only provide an organization structure in which innovative ideas are encouraged to appear, but also ensure an appropriate reward system is in place so they continue to emerge. Hence, Adair (1990) offers the advice that the certain contents of reward package might influence and support the innovation process. It implies that some HRM practices with purposeful strategies can stimulate the employees’ creativities, accordingly, improving the company’s whole innovation process’ performance. And as mentioned, recruitment strategy and training practice can achieve the diversity at individual and group levels. Improving the organization’s diversity also stimulate innovation by rich and different knowledge background and different viewpoints. This means HRM strategy can stimulate innovation indirectly, through its medium or its input.

3. **HRM communicate with innovation**
   In most texts, the researchers agree that HRM and innovation have close relationships. These relationships can be communicated through the certain channels. Majaro (1988) states that the aim of establishing communication between the innovation and HRM is to ensure that a systematic channel catches and examines as many creative ideas as possible and that the wasted element is reduced. Furthermore, Nonaka and Tekeuch (1995) suggest that communication and collaboration are well recognized factors in stimulating ideas since individuals, groups and organizations can learn from each other only if they communicate. Communication is also an informal and formal approach to share knowledge within the group or the organization. During the procedure of communication, openness, sharing and knowledge transfer are considered as crucial factors in ensuring that ideas are implemented into valuable organizational innovations, by increasing the quantity and quality of knowledge and helping people gain different perspectives.
3.5 Conclusion

From the figure above, it illustrates that HRM does not stimulate or influence innovation directly, and link with innovation directly with arrow. Between HRM and innovation, creativity can be considered as a medium and diversity can be considered as one of input of innovation. It implies that HRM does not really involve into the process of innovation. However, the important role of HRM can not be ignored due to noninvolvement. Diversity, as one of the input of innovation, provides the rich resources of different talents, different perspectives and opportunities for creativity and innovation. Creativity, as the start phase of innovation, offers the generation of creative ideas for innovation. HRM practices can be regarded as routines inside the company to create the company’s culture and climate. By combing HRM practices with purposeful strategies can stimulate diversity and creativity, which achieves to stimulate and influence innovation indirectly. For instance, through executing the rewarding strategy, building the creative teams, training, and measuring the creative performance, these HRM practices with purposeful strategies stimulate the employees’ creativities, which provides abundant creative ideas to test and put into practice. Through recruiting the employees from different knowledge backgrounds, and setting up the diverse training programmes, the company can utilize the employees’ different viewpoints from different perspectives to rethink the current projects and products, influencing the innovation indirectly. HRM offers informal and formal communication platform for employees, openness, sharing and knowledge transfer speed up the implementation of the process from ideas to valuable organizational innovations. To conclude, HRM practices and strategies can influence can stimulate innovation by communications
Chapter Four

HRM and KM

This chapter will focus on the theoretical links between HRM and KM. First of all, the introduction of roles that HRM plays in KM is given, and then combining HRM practices with HRM strategies to explain how HRM drive KM in the right direction will be explored. The theoretical links between HRM and KM will be summarized from the literature research. Finally, an integrated table of HRM the use of HRM strategies to remove the barriers and its roles playing in KM will be developed and explained.

4.1 The roles of HRM in KM

Employees are regarded as the true agents in business where all tangible and intangible assets are results of human action (Sveiby, 2001). This view is also supported by Rubenstein-Montano et al. (2001) who state that people are the driving factors that determine the success or failure of knowledge management initiatives. Yahya and Goh, (2002) state that the main tasks of HRM in knowledge management, in general, are to monitor, measure, embodiment, distribution and the utilization of knowledge by the employees. And they embody these roles into eight points.

1. alignment of knowledge management with business directions
2. identification of the benefits of knowledge management efforts
3. choosing the appropriate knowledge management program
4. implementing a know-how strategy
5. creating supportive environments for knowledge management
6. use of enabling technologies for the knowledge management program
7. creating the knowledge management team
8. creating knowledge management leadership

According to their statements of HRM roles in knowledge management, these roles can be developed into two categories, supportive category and implemental category. Namely, some of goals of HRM are to support better implementation of KM, preparing a foundation for launching it; while some of them can be considered as a part of completing the implementation of KM.
The managers need to make clear what benefits knowledge management can bring into the company (such as save time, lower the total costs and speed up the knowledge sharing and application), which can become the driver to push the company to consider launching knowledge management for gaining these benefits. Due to the launching of new management system, there must be many changes emerged inside the company. The purpose for adoption of this new management system and adjustment these changes, the managers should create a preparative environment to handle these changes. The changes include not only the changes in rewarding regulations and the measurement of performance, but also the change in company’s culture, organization’s structure and employees’ working behaviors. HRM can utilize strategies and practices to stimulate the employees’ initiatives to face these changes and help them adapt these changes, resulting in creating a supportive environment for the launch of KM. One of the main tasks of HRM is to arrange the right employees into the right position, according to their skills and professional knowledge, in order to make fully use of their values. Choosing the suitable people to execute KM is also HR managers’ responsibility, which can be considered that HRM provides supportive hand to KM.

In the other category, HRM plays an implemental role for KM, means it is an indispensable tool to complete KM. The standards for selecting KM programs and enabling technologies should be based on the satisfaction of human behavior’s habits. From this point of view, since HR managers are close with the employees and familiar with their working behaviors, they can provide the useful information to IT people for choosing appropriate knowledge management programs and use the enabling technologies. The ultimate goal of KM is to service the whole business and gain the competitive advantage in the long term, HRM can align itself with KM drive it into the business rode.

### 4.2 HRM Strategies and Practices in Knowledge Management

If KM is to be the core competency and strategic intent of an organization, it is defined primarily as a process to utilize the employees’ knowledge with the support of IT system in order to create competitive advantages. Only when human capital and knowledge
become sources of difficult to imitate by competitors, then KM is truly become competitive advantage in the market. Some researchers (such as Smith and Kelly, 1997) believe that future economic and strategic advantage will rest with the organizations that can most effectively attract, develop and retain the best and the brightest human talent in the market place. Although most companies and organizations realize the important role of HRM in KM field, they still find it difficult to deal with their internal links due to many concepts and links are too vague to understand and implement. There are many companies are using information technology as the strategic weapon in harnessing explicit knowledge, but they also find its disadvantages. Hence, apart from using IT to store the data and communicate with each other, the organizations start to focus on HRM practices with purposeful strategies to bring out the best to their knowledge workers. The following HRM practices and strategies will indicate how HRM can drive KM in the right direction.

4.2.1 Trusting HR philosophy

Successful HRM mainly depends on whether the company establishes the trust and treat fairly environment within the company. No HRM strategy can succeed unless the organization has an overarching HRM philosophy that assures its employees that they are working for a caring, nurturing, trustworthy organization. People consider employment more as a social relationship than as a contract. Trust and fairness are at the very heart of KM, as without them there is no sharing of tacit knowledge. As mentioned in the pervious chapter, tacit knowledge sharing heavily depends on the employees’ communication and their initiatives, without a trust and fairness environment, the employees will not feel safe to share their unique experiences and professional knowledge which they live by. Kanter (1997) also agrees that organizations have to create an HR philosophy that ‘restores people to the heart of organization’ (p. 5), since knowledge resides in individuals who have discretion to use and share it as and when they want. Hence, trust strategy can be considered as the basic principle of making the other HRM strategies.

4.2.2 Institutionalizing learning to learn

Learning is a new strategy to gain the competitive advantage in the market due to its function of knowledge acquirement and knowledge update. Senge (1990) advocates that learning can result in a shift of mind. From this point of view, learning is also an approach of knowledge creation. In an organization, learning should take place at the individual, group and organizational level and HRM can facilitate learning at all these levels (Rus-Eft et al., 1997). At the individual level, HRM has responsibility of recruiting and retaining knowledge workers who can develop right competencies both in technical and behavioral areas. The employees need to be motivated through performance measurement and reward system to convert their expert mental models into explicit knowledge. At the group level, HRM needs to enable people to work in teams both within and outside organizational to learn from each other. At the organizational level, HRM strategy and system need to work for creating a knowledge-conducive learning atmosphere. In the knowledge-conducive learning atmosphere, explicit knowledge can be
codified and transferred through training and development, in routine and non-complex work situation. At these three levels, HRM practice, training program, is cooperated with this strategy, becoming an important knowledge acquisition and knowledge update mechanism. It can also help to establish contacts between local and parent companies’ employees, and thus, promote collaboration and knowledge exchange (Lyles and Salk, 1996, Lane et al, 2001). The role of HRM during the learning and sharing knowledge process is to ensure that people are encouraged to boldly experiment and share their views without any fear and apprehension. And HRM should publicly recognize and reward people who share knowledge and create interactive forums to facilitate the process, which is another strategic for stimulate the knowledge management.

### 4.2.3 Creating knowledge-oriented combinational systems

In order to create and promote a learning environment in the organization, HRM with the help of IT system need to be geared towards knowledge management requirement. Some aspects are considered as the critical issues in this combinational system. In general, this combinational system needs ICT support and build up the internet and intranet to acquire and share the knowledge. Currently, some activities have been implemented by the internet, such as e-recruitment and e-learning. One of the important functions of intranet is to help all the employees inside the company communicate with each other and share the information and knowledge.

### 4.2.4 Recruitment and Retainment

In the so-called war on talent, organizations will have to compete fiercely for the best talent. At present, some human resource information systems are built for decision support, and tread carefully in outsourcing recruitment. In terms of selection, the more structured the interview process, the more is its validity and reliability (Fernandez-Araoz, 1999). Schmidt and Hunter (1998) suggest that the selection techniques, such as general mental ability, integrity test, work sample tests and structured interview, rather than any single method alone, is the most successful way to select the best candidate. These strategies of recruitment aim to acquire the new knowledge that might not exist in the company. Moreover, if the right people are in the right positions, the company’s capability and competitiveness will be increased.

Except for money, today’s knowledge workers demand reasonable security of employment, employability, autonomy, management transparency, open culture, tasks that are challenging and suit individual personality and orientation, social network, immediate and frequent feedback and rewards, ownership of ideas and flexible working conditions (Mohan, 2004). All of these need to be done by making the relevant HRM policies to make the employees feel safe. These strategies are always combined with human resource planning and career management, these two HRM practices. Human resource planning includes creating teams with a balanced skill-mix, recruiting the right people, and voluntary team assignment (Gupta and Singhal, 1993). It analyzes and determines personnel needs and talent in order to create effective innovation teams. In addition, career management can help the company retain the knowledge workers. This
practice includes empowering people, leading by example, and continued education (Gupta and Singhal, 1993). It matches employees’ long-term career goals with organizational goals through continuing education and training. Namely, by helping with knowledge training and education, the employees can follow their own career plans in the future work. It also provides the employees a motivation to learn and update knowledge by themselves.

4.2.5 Performance management

Performance management includes encouraging risk taking, stimulating innovation, generating or adopting new tasks, peer evaluation, frequent evaluations and auditing innovation processes (Gupta and Singhal, 1993). This strategy appraises individual and team performance, by following the performance measurement, the employees’ creativities and initiatives are stimulated, resulting in improving the individual innovativeness and company profitability. An excellent performance management system is one of the key difficult-to-imitate competitive strategies within the domain of HRM. The company can avoid the competition within the company by clearly defining, measuring and thereafter, rewarding desired behaviors and competencies.

Recently, one of the popular performance measures-balanced score card -is being used to measure the employees’ work performance. However, each stage of the performance management, i.e. system development, appraisal process and feedback, should ensure procedural fairness, interpersonal fairness and outcome fairness (Gilliland and Langdon, 1998). However, which tasks should be appraised and who should assess employees’ performance are also taken into account.

4.2.6 Rewards management

Rewards management includes freedom to do interested research, freedom to fail, freedom to form teams, freedom to run businesses, balancing pay and pride, noticeable pay raises, dual career tracks, promoting from within, recognition rewards, and balancing team and individual rewards. A wise way to use reward management system is supposed to exert the maximum positive impact in a learning environment and together with measurement. Under this situation, Heneman et al. (2000) suggest a new pay system. this new pay system exhibit a strategic focus in that they highlight the person, output or behaviors and are more inclusive, dynamic and decentralized. The content of this new pay system include broad, skill/competency or results based variable pay, such as profit or gain sharing or employee stock options. This is one of the reward management strategies to encourage the employees to develop their performance and share the knowledge. This strategy also uses rewards to motivate personnel to achieve an organization’s goals of productivity, innovation and profitability.
4.3 Integrating the barriers of managing knowledge, HRM strategies (practices) and the roles of HRM in KM

Table 4 indicates that the certain HRM strategies (practices) can overcome the barriers from people category, and HRM plays the different roles in KM.

<table>
<thead>
<tr>
<th>barriers</th>
<th>HRM strategies (practices)</th>
<th>the roles of HRM in KM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inertia to change</td>
<td>Trust HR philosophy</td>
<td>Creating supportive environments for KM</td>
</tr>
</tbody>
</table>
| Too busy, no time to learn | Institutionalizing learning to learn (training program)  
Creating knowledge-oriented combinational systems  
Retainment (human resource planning, career management) | Choosing the appropriate KM program  
Creating supportive environments for KM                                                |
| No discipline to act | Performance management (performance appraisal)                                            | Identification of benefits of KM efforts  
Alignment of KM with business directions  
Creating KM leadership                                                               |
| Motivation           | Performance management Reward management (reward)  
Retainment (Career management)                                                        | Creating supportive environments for KM                                                |
| Transferring knowledge to new people  
Teaching older employees new ideas | Institutionalizing learning to learn (training program)  
Creating knowledge-oriented combinational systems | Use of enabling technologies for KM program  
Implementing a know-how strategy  
Choosing the appropriate KM program                                                    |

Table 4: integration of barriers, HRM practice and the role of HRM

As launching the KM, some changes might occur inside the company (such as the changes of company’s culture, the change of organization structure, rewarding regulations and performance measurement and the change of human behaviors). Normally, people are afraid of changes when they are used to an environment. Through building the trust HR philosophy, the employees have the confidences for the company and are willing to following and adapting these changes to meet the company’s development requirement. Therefore, under this supportive environment HRM creates for the launch of KM, the barrier of inertia to change from people can be removed much easier than the company does not execute the trust HR philosophy.
People who do not learn or update their knowledge always have an excuse that “I am too busy, and do not have time to learn”. The company can use three HRM strategies to block this excuse from now on at organizational level. By creating knowledge-oriented combinational systems, the employees can utilize the intranet or internet to learn at home or in the company at any time. Moreover, the company also provides the training programs to employees, in order to force and supervise their learning progresses. In this way, learning is institutionalized at organizational level, creating supportive environment for KM. In addition, in some companies, learning is an individual work for each employee. The employees make their own career plans and discuss with their managers, and then learn what they want to learn to make their plans come true, at same time to meet the company’s development needs, too. At group level, the employees also can make use of the opportunity of team works to learn from each other. The aim of human resource planning is to create teams with a balanced skill-mix, which can increase the possibility of learning knowledge from different fields. By implementing the strategies and practices at these three levels, the employees do not have excuses to avoid learning assignment.

The employees always complain that they do not have discipline to act when they share their knowledge with the others. This barrier can be removed by the strategy of performance management. The measurement of performance can offer disciplines for employees when they share, update and acquire knowledge; by following these disciplines, the employees could get a excellent performance for their works, otherwise, the employees could get fired due to a bad performance. These disciplines can not only include the measurements of employees’ performance, but also consist of the directions of KM developments in the long run. Hence, the roles of HRM could be ‘identification of benefits of KM efforts, alignment of KM with business directions and creating KM leadership’.

As mentioned above, most tacit knowledge sharing and knowledge learning mainly depends on the employees’ willingness and their motivations. By reward and performance appraisal strategies, the employees not only can gain money rewarding, but also get promotions in their career development. These strategies can stimulate the employees to transfer their tacit knowledge into explicit knowledge and shared with the others, in order to get rewards and good performance appraisals.

Through using the training programs and certain knowledge- oriented combinational systems, knowledge can be much easier to be transferred to the new incomers and taught to the older employees inside the organization. HRM can help choose the appropriate KM programs and use enabling technologies for these KM programs according to the human learning behaviors. And during the process of sharing and learning, HR managers also implement a know-how strategy to stimulate employees to share their knowledge, which also remove the barriers of no motivations.
4.4 The theoretical links between HRM and KM

It is obvious that HRM and KM have strong relationships since HRM plays different roles in KM. But how HRM and KM are linked in detail is also being researched from different perspectives. By viewing the previous literatures, I found three main links between them.

1. **HRM practices can remove the barriers for knowledge transfer/sharing**
   In large high-tech companies, the cross-cultural knowledge transference is a main problem due to the effects from different culture, different languages and different locations. Minbaeva (2005) and Minbaeva et al. (2003) have analyzed how HRM practices can help overcome transfer barriers and facilitate knowledge share, pointing to the successful diffusion and sharing of valuable knowledge within the company through similarity of reward practices and the use of training, performance appraisal, and internal communication practices and programmes. It is obvious that the ability and motivation of knowledge receivers and sharers, and the frequency of communications are very important elements during the knowledge transfer and sharing. Due to the employees’ involvement, hence, high performance HRM activities are regarded as enhancing knowledge transfer, especially if such practices are applied together in a complementary way.

   For instance, Minbaeva et al. (2003) put much effort on integrating the knowledge transfer and sharing and the HRM-performance. The results of the study indicate that through the extensive use of training, performance appraisal, performance-based compensation and internal communication can develop the absorptive capacity of knowledge receivers and stimulate the enthusiasm of knowledge sharers. This development will contribute to the knowledge transfer and sharing in high-tech company.

2. **HRM practices supports KM with ICT help**
   Recently, with the boom of information communication technology, the approaches that organizations are related to their employees are changed. Information communication technology has the ability to offer instant access to large amounts of data and information and to enable long distance collaboration within individual employees and teams within the organization. This implies that to some extent, ICT is involved into HRM and KM. There are a few ways that ICT involves HRM to support KM.

   1) **Intranet offers the opportunities of knowledge sharing and training**
      The intranet is a network based on TCP/IP protocols belonging to an organization, usually a corporation accessible only by the organization’s members, employees, or others with authorization (intranet, internet source). It is a powerful tool which can encourage communication and collaboration within the individual employees and virtual teams distributed all over the world. Through the intranet, even unknown employees can share their own knowledge and experiences in the long distance, which speed up knowledge sharing and information exchange among the employees.
The intranet can also implement a distance training system through the combination of various pedagogic techniques (Jose´, Juan & Reyes, 2004) inside the multinational high-tech companies. This solution for training employees all over the world can be known as e-learning course based on computers and the internet. The benefits of setting up e-learning course for employees and organizations are significant. E-learning course can be accessibility at any time and place by the employees, which provides maximum geographical and time flexibility. And it can offer a large set of teaching materials in digital versions for employees to search. By the launch of e-learning course, training practice is reinforced without limitation of different locations and different languages.

2) **The performance of HRM is enhanced by database and yellow page**

Database is not only used to store the information of marketing and organization, but also store the reports of past projects’ results and articles of past experiences from employees. The accessibility to the database provides huge information and data for the future projects, which can shorten the ‘learning by doing’ time for new entrants and other employees. Furthermore, the organizations can appraisal the employees’ performance according to their reports and articles stored in the database that can not easier to be modified and deleted. To some extent, by appraisal the reports and articles stored in the database, ensures the results and procedure of appraisals are fairness and openness.

Through building the yellow page, the organization can learn its employees very well, what knowledge they have, what projects they have been involved, and what they did in their career development. The managers can find the right person to take certain projects according to their past experiences and professional knowledge by searching engines in yellow pages. This will shorten the time of selection and recruitment inside the organization. Yellow page also provides the contact information for the other employees and managers. The employees can be reached at any time once the emergence happens.

The performance of HRM practices is enhanced by the implementation of intranet, database and yellow page. In the other words, ICT helps HRM support relevant knowledge management activities. Gloet and Terzirovski, (2004) conclude that only ‘when the firms implement both of the HRM practices and IT practices, KM can contributes to innovation performance’. Armstrong (2000) also stated that KM is actually an evolved form of human resource management, using IT as the supporting mechanism in the human interactions and collaborations process. And he views the role of HRM in KM as to facilitate the dissemination of learning through workshops, projects and conference. From these two points of view, it implies that the employees in their working routines can take advantage of IT to acquire and update their knowledge inside the company, implementing a part of KM.
3. **HRM strategies (practices) drive KM in the right direction**

The company makes use of HRM practices and purposeful strategies to remove all the barriers from people category. And from table 4, we can see that one strategy can be used repeatedly to remove different barriers with different goals. For instance, performance management strategy can remove the barriers of motivation and no discipline to act, however, the goal to remove the barrier of motivation is to create supportive environment for KM, instead, the goals to remove the barrier of no discipline to act are to identify the benefits of KM efforts, and drive KM into business directions.

### 4.5 Conclusion

ICT supports HRM practices to remove the barriers and drive KM into the right direction. On the other hand, ICT also supports the activities of KM; the focus of this chapter is on the HRM and KM, hence the links between ICT and KM are not illustrated in the figure above. Summarizing three links described above between HRM and KM, there is only one tangible link existed, which is HRM strategies and practices can remove the barriers for KM with ICT help at some points and drive it in the right direction.

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Chapter Five
Case Study

This chapter will focus on describing three cases and analyzing them. Firstly, the method of doing practical research is introduced, and then a HP case illustrated my refined model of relationships of HRM, KM and innovation. Subsequently, the descriptions of SKF case and Ordina case are summarized from the interviews, and according to these descriptions, two case models can be built based on the refined model and analyzed step by step.

5.1 Methodology

Sample

During the period of doing my literature research, I found a HP case researched by Albert and Picq in 2003 and published in Journal of international business studies, which is closely related with my topic of this thesis. Hence, I borrowed this case for building my refined model by the combination of the theoretical links and analysis. The purpose for connecting the theoretical links with practice, I interviewed two high tech companies, SKF and Ordina, located in the Netherlands, collected the information about their HRM, KM and innovation. The consideration of this selection of SKF and Ordina focuses on the companies doing business in technology field. Here, I would like to appreciate the managers of SKF and Ordina who involved into my interviews.

Data collection focuses on the organization’s division level, not on the individual level or the organizational level. Normally, a large high-tech company has a few divisions which are responsible for different services to clients, and distributed in different locations in one country or even in different countries. Due to limitations of time and fund, I can not interview all the divisions, or too many individual employees in one company, and it is not necessary since all of divisions usually share one common management system. Hence, I choose one division to see the overall picture of a company. I invited two managers of SKF, one is the board manager, and the other is the manager of patent department. In Ordina, I was introduced to one of project managers in finance division, who knows the company’s management system clearly.

Currently, it seems that knowledge management department does not really exist in most of high-tech companies, so most activities of knowledge management might be penetrated into human resource management, R&D management, or ICT management. However, ICT management always can involve too many technology considerations; so I did not take it into account in my research. By understanding the approaches and models of HRM, KM and R&D management, I can explore the internal links between HRM and
KM, HRM and innovation, and KM and innovation in practice. And according to these practical links, I can check if the theory meets the practice.

Data collection: focus of interviews

The approach of data collection is by enquiries to interviewers. The questions are focused on how the company manages their employees and their knowledge, how the company manages the innovation process, and how the company stimulates the employees in the process of KM and innovation. During the dialogue, what the interviewers said are recorded as a means for further study.

The questions for interviews

1. Do you have knowledge management department or analogous teams existed in the organization?
2. How do the employees share their past working experiences with each others, and how they know each other’s working field with their professional knowledge?
3. In which approaches do the employees share, acquire and update the knowledge inside the company?
4. How do you manage the employees? Such as recruitment, performance measurement, reward management and training.
5. How do you select the people to make a team for certain projects inside the company?
6. How do you select the people to make a team for certain projects inside the company?
7. How do you make the creative ideas from common employees come true, what is the simple process of create a new invention?
5.2 Case Study

This section will summarize the description of cases that can provide the more detail information about HRM, KM and innovation within the high-tech companies. The first HP case is from Journal of international business studies, researched by Albert and Picq in 2003, which can be an example to illustrate a basic relationship among HRM, KM and innovation in practice. By analyzing HP example, I will refine my original research model drawn in chapter one and give an explanation why the model needs to be changed. And then basing on the refined model, SKF model and Oridna model will be built and analyzed.

5.2.1 The Description of HP Lab case

(Source from Albert and Picq, 2004)

HP Lab’s experience can be an example for providing the description of the process of how it uses HRM strategies to enhance KM and the company’s innovativeness. HP Lab is the central research lab for the Hewlett-Packard Company. The Lab’s primary role is finding, inventing, and transferring technologies to maintain HP’s competitiveness in the market. The lab consists of 300 support people and 900 engineers, most of them have a PhD. The lab is geographically dispersed with facilities in the USA, UK, and Japan. These scientists and technical staff work in their esoteric functional silos with little collaboration. Due to this situation, HP Lab considered the knowledge transference process in the knowledge management field and human resource management field more detail. The knowledge transference process can be divided into three parts, the implementation of a dialogue process, and the creation of a support function and the emergence of communities of practice: networks. These three parts involve the common employees, the bottom and top of managers and some relevant company’s strategies.

1. The implementation of a dialogue process

The process began with the director of HP Lab, and vice present of R&D for HP launching an organization-wide dialogue. During this process, a variety of communications systems were used including surveys, groupware, and informal discussions with employees. By dialogue process, the employees are expected to answer: “what the world’s best industrial research lab should look like and what is precisely mean relative to their current job/position?” (Albert and Picq, 2004, p.173)

2. The creation of a support function

In HP Lab the HR manager is placed in a full time support role and given adequate financial resources to facilitate the transformation process. The main roles of HR department include: “listening and questioning to enable collective exploration between different suggestions and similar or different ideas among lab personnel; encouraging thinking-outside-the box, and encouraging risk-taking and trying innovative ways of doing things” (Albert and Picq, 2004, p.173).
3. The emergence of communities of practice: networks for action taking

During the dialogue process, coupling with the HR manager’s supportive behavior, it provides a fertile climate for communities of practice to grow. It is reported that during the first year, 36 informal groups emerged that collaborated on specific issues and projects focused on transforming HP Lab into being the world’s best industrial research lab. And by doing this research, one key finding is that knowledge must be shared throughout the organization in order to develop and sustain innovation. The emergence of these communities of practice supports the theme of improving knowledge access and transfer throughout the organization. Here I quote one example of the focus of these communities of practice, which can explain how the communities of practice achieve their goals.

1) Formal network

The company builds a program called “Chalk Talks”, emerged from two engineers asking: “why do not engineers ever talk to each other?” (Albert and Picq, 2004, p.174). During the first two years of this program, 15 to 150 engineers attended this employee-sponsored event. Other engineers, who had asked, “how could we get mentored” (Albert and Picq, 2004, p.174) developed the HP Lab mentoring program, which has helped create 30 pairs of engineer-managers during a three-year period.

2) Informal network

A program that emerged from an informal network of employees with common interests is focused on measuring the output of one of the labs. In this program, interested line and lab staff used data from customer interviews to create standards for quality and service. During the second year, these metrics were adopted across all HP lab facilities, thereby, exemplifying the theme-improve knowledge access and transfer throughout the company.
5.2.1.1 Refined model

After literature research, a few main theoretical links between KM and innovation, HRM and innovation, and HRM and KM have been elaborated and concluded. The theoretical links imply that the elementary research model can not present exactly. Combining with the analysis of HP case from literature, the elementary model can be refined in figure 5.

![Refined Model Diagram]

Explanation of the model

1) People means a barrier to manage knowledge, and the arrows pass through this barrier to KM means that this barrier has been removed by HRM.
2) The black area means that some parts of knowledge management and innovation have overlapped and formed a block area that we do not exactly know what is in it.
3) The arrow points from HRM to innovation, which means HRM influence or stimulate innovation.

5.2.2 Analysis of HP case as a illustration of refined model

1. HRM can be seen as a driver for KM and innovation

As stated in pervious chapters, the link between HRM and KM can be summarized that HRM strategies and practices can remove the barriers for KM and drive it in the right direction, and the links between HRM and innovation can be summarized into two points, HRM strategies and practices influence innovation, and HRM communicate with innovation. Tcisk (1998) identifies three major broad categories
of managing knowledge barriers\(^1\), the barriers from people is one of these three categories. According to the theoretical link between HRM and KM, it is proved that HRM can remove the barriers and drive KM in the right direction by utilizing the suitable strategies and practices. During this process, HRM plays various roles in knowledge management\(^2\). Similarly, HRM strategies and practices also can influence innovation and communicate with it regularly; hence, HRM is seen as a driver for KM and innovation and put in the bottom of the refined model.

HP Lab is a successful case that takes advantage to HRM strategies to enhance the quality of KM and the company’s innovativeness. HP launches a series of HRM activities, including dialogue, reinforce the roles of HR managers and build informal and formal networks. These activities play the different roles for removing the barriers; therefore, I will use these different roles to analyze the links between HRM and KM.

1) **HRM chooses the appropriate knowledge management program**

The scientists and technical staff might use “too busy, no time” as the excuses to explain why they are always working on their own field with little cooperation. The launch of dialogue process provides the time for all scientists and technical staff to discuss what can be called as the best industrial research lab, how far they are from being it, what they are short of. The most important goal is to give the employees enough time to think what they can do for achieving the best industrial research lab. By launching this dialogue provides open forums for discussion, questions, and answers. It establishes a foundation for creation of knowledge repositories, and also enables learning from past successes and failures. Hence, the focus of the dialogue process is to build the notion of creating a knowledge-based, learning organization to cultivate an additional source of competitive advantage. The application of dialogue can be seen as a successful choice of knowledge management program, which offer the time and approach to share and store knowledge, remove the barrier of ‘too busy, no time’.

2) **HRM creates supportive environments for knowledge management**

As described above, HR department are mainly responsible for collecting and exploring different suggestions and ideas, and giving finance support to facilitate the knowledge transformation process. In essence, the behavior of the HR manager is to support the knowledge management, and create a supportive environment for it.

3) **HRM aligns knowledge management with business directions**

The emergence of informal network of employees takes advantage of the data from customer interviews to create the new standards for quality and service. And these standards are accepted throughout the company. This strategy means that this knowledge management activity is orientated with the business directions to meet the consumers’ requirements.

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\(^1\) This have been stated in chapter two, 2.2 managing knowledge and barriers

\(^2\) For details please read chapter 4, 4.3 integrating the barriers of managing knowledge, HRM strategies (practices) and the roles of HRM in KM
2. **KM and innovation have an overlap area**

The theoretical links between KM and innovation are summarized as ‘KM and innovation are found on the same elements: employees’ experiences and knowledge facts’ and ‘the activities of KM can influence the activities of innovation’. From these two points of view, it can be concluded that KM and innovation must have an overlap management area. In the overlap area, the approaches of managing knowledge can be regarded as the approaches to manage innovation, even if we still do not know what are in the black overlap area.

HP lab is a research lab, focusing on doing research and development field. Knowledge creation and development can be seen as the main source of creating any types of innovation, resulting in developing the lab. The goal of managing knowledge is to achieve the improvement of quality and quantity of innovation, therefore, to large extent, some approaches of managing the activities of KM can also be considered as the approaches to manage innovation in order to gain the profits for the organization. This is a reason why KM and innovation are overlapped in the model.

3. **HRM stimulates innovation**

The theoretical links between HRM and innovation are summarized into two points: HRM strategies and practices influence and stimulate innovation, and HRM communicate with innovation\(^3\). In HP lab, the other aim of launching dialogue process is to improve innovation in support of future new product and new process development. In the long run it can be seen as having the potential of facilitate HP Lab’s capacity to manage shorter cycles and compressed cycle time. On other side, HR manager encourages employees thinking-outside-the box, and encourage risk-taking and try innovative ways of doing things, which builds the foundation of managing innovation. By reinforcing the roles of HR manager, the employees’ creativities are stimulated and the whole organization’s innovativeness is improved.

Combining the theoretical links with the analysis of HP case, the explanations of refined model are implemented. The following SKF and Ordina’s model will be built based on this refined model, and adjusted according to the company’s facts.

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\(^3\) See chapter 3, 3.3 conclusion
5.2.3 The Description of SKF case

1. Background

The SKF Group is the leading global supplier of products, customer solutions, and services in the business of rolling bearings and seals. The Group’s main competencies include technical support, maintenance services, condition monitoring and training. The SKF’s organization structure is divided into five divisions, which are Industrial, Automotive, Electrical, Service, and Aero and steel. SKF was founded in 1907 and now it has built 100 manufacturing sites distributed all over the world (SKF website, about SKF). From the very beginning SKF has focused intensively on technical development, and the results of the Group’s efforts in the area of research and development have led to a growing number of innovations that has created new standards and new products in the bearing world. The following figure is the over whole SKF Group’s organization structure.

![SKF organization chart](image)

To establish and maintain global leadership in a business, SKF knows clearly its mission and where it is heading. The whole Group shares the same basic internal values, that it uses the same performance drivers and continuously improves competencies to better serve the customers more efficiently. Hence, in SKF Group five divisions share the same management systems, study one of them can be get the overall picture of the company’s management system.

**SKF Group’s KM definition**

The definition of knowledge management in SKF is “a cross-disciplinary process for acquiring new knowledge and managing existing knowledge to enhance competitive advantage” (SKF website, KM Definition). And knowledge management is driven by a
knowledge sharing culture supported by agreed process using common reliable infrastructure to enable validation, distillation and transfer of knowledge across the SKF Group. A complete infrastructure includes employees and information technology enablers. In other words, in SKF Group knowledge management is related with human resource management and ICT management.

1.1 SKF Business & Technology Park’s background

SKF’s R&D can be divided into three parts: SKF product R&D, SKF process R&D and SKF product development centers. All these three parts focus on their own fields and service for the whole SKF Group. SKF business & technology Park is product R&D, located in the Netherlands, which contributes on the product research and innovation process. SKF process R&D is located in Sweden, other SKF product development centers are distributed into many countries, such as Sweden, German, France, US and India etc. My interview took placed within SKF business & Technology Park, focusing on gaining the information of HRM, KM and its innovation process. Firstly, the board of manager introduced the organization’s internal structure. The following figure can indicate that the positions of HR department and KM department in the organization’s structure.

The organization’s draft structure is as following, which is to indicate the relationship between HRD and KMD:

![Figure 7: the organization structure of SKF business & Technology Park](image)

2. KM in SKF Business & Technology Park

From the structure drawn above, knowledge management department exists separately within the organization. During this interview, I did not gain the information from the knowledge manager directly; instead I talked with a manager of the patent department which is a unit of knowledge management department.

2.1 The role of knowledge management department
1. **Quality Control**
The quality of product research and development needs to be controlled and supervised. Knowledge management department takes this responsibility. In my opinion, the quality control also includes the quality of knowledge transference within the company, for instance, the new knowledge or information inside or outside the company should be distributed into the employees who are working in the relevant fields. Supervising the quality of knowledge distribution can guarantee that every employee will keep pace with latest knowledge and technologies.

2. **Apply the knowledge**
The final aim of creating new knowledge is to apply it into the real product. One of the responsibilities of knowledge management manager is to try to fit the new technology into the exist products or exploit it into the totally new product.

3. **Participate in part of ICT management ( software development or artificial intelligent build)**
The implementation of communication among the employees in the multi-national high-tech companies heavily depends on the information communication technology. One of the roles of knowledge management department is to develop and maintain the communication software. The reason why KM department also involves into a part of ICT management is because that the employees working in KM department are dealing with the processes and approaches of knowledge transference, knowledge distribution, knowledge sharing, and knowledge learning. Hence, they can provide the useful data and information to IT people for developing or inventing the software in order to improve the quality of knowledge management process.

4. **IPR (intellectual property rights)**
This role of KM department is spilled out an independent patent management department, which is one of units of KM department. The manager of patent management department is responsible for collecting the creative ideas and different suggestions from the employees and help they do the relevant researches. If the idea is proved to be totally new and unique in that field, the manager of patent management department will help the inventor patent this idea and try to keep it security inside the company.

2.2 **The approaches of managing knowledge**

1. **Managing the employees’ past experiences**
After the employees finish their own parts of the project, they are required to deliver their R&D results with formally writing on paper, and then put it into the R&D report archive. The aim of storing these reports is to manage the employees’ knowledge and experiences gained from the research projects, and sharing them with the other employees when they do the similar projects.

2. **Knowledge acquirement**
There are two ways for the employees to acquire the new knowledge in their working fields.

1) By self-learning
   Learning is the individual thing inside the organization at this moment. The employees need to know clearly what they want to do and what they want to learn for their future career. They make their own individual development plans and discuss with their direct manager once a year, who will consider what he can do to help the employees achieve the plans. In short, learning or updating the new knowledge is the individual’s responsibility.

2) By relevant knowledge distribution
   KM department has responsibility to collect the information about the new technologies inside and outside the organization. These information and knowledge are distributed into relevant fields in order that the employees can update their knowledge about what has been researched and what is studying now. Through the process of distribution, the employees can always keep gaining the latest knowledge in their own fields.

3. Knowledge sharing
   There are a few approaches to find the knowledge you might need for your own project inside the company. You can learn the past experiences from the other employees and you can search the knowledge through the intranet.

   1) Learn from the other employees
      If some employees’ project is similar as some past projects, then they can look up the list of project teams and see who are still in the company. Then according to the contact information, they can contact with them directly and ask them to share their experiences and relevant knowledge.

   2) Access the report archive
      The report archive is an active system which is accessible for every employee of SKF in the world through intranet. The employ can search the knowledge he/she may need in the report archive. The reports include the results of the past projects, the experiences and the knowledge might be required for the projects. There are two ways to find these relevant reports: people finder and solution finder. People finder means that you can search the reports according to the writers’ name. The employees also can search the reports that might include the knowledge they may need by solution search engine. This is one way to share the knowledge within the organization.

   3) Ask SKF system
      Now SKF is building “ask SKF system”. This system includes the Q&A forum, which means the employees can leave their questions in the forum, and SKF’s experts or the other employees who happen to know the answers will give you the advises or correct answers as soon as they can. This forum provides a
communication platform for all the employees, the clients and the consumers who may become the clients of SKF in the future.

3. HRM in SKF Business & Technology Park

3.1 Human resource management structure

Inside the organization, the structure of managing employees can be followed by the management of project’s scales. With scale-up of the projects, the managers are called task leader, project leader, project manager and project director. This is also the procedure of employees’ career development. In this human resource management structure, the superiors have full responsibility for their own underlings.

![Hierarchical human resource management structure](image)

3.2 Career management

1) Working with talents
   This system is an assessment system which identifies what talents the company has and what kind of talent the employee possesses. Through this system the managers can get to know their employees very well, and help them assign the work to the most suitable employees in the future work.
2) PDP (personal development plan)
   As mentioned above, the employees are responsible for their own development. And in the organization, there is a system called PDP (personal development plan), which helps employees make their own career development plan. The plan can include what direction or field the employees want to go and what knowledge they want to learn more.

These two approaches to manage the employees’ career development are executed by HR department. The main role of HR department is to support the employees’ personal development plan that is regarded as a driver for the process of HRM.

3.3 Performance Measurement

The performance measurement is a mean for assessing the employees’ work performance, providing an evidence for promotion or demotion. In the organization, the performance measurement is carried out once a year, and then the direct managers deliver and store the yearly performance reports. Obviously, this performance report is related with the employees’ salary change and career change. By means of career change, the employee can get promotion or demotion according to his good or bad performance within one year or last few years. Every year inside SKF there is 10% “move” target. Move means the job change inside and also outside SKF, which include that the new employees enter the organization and the old employees with bad job performance move outside the SKF.

The main responsibility of performance measurement is taken by the direct managers of every employee. The HR department just gives the supportive hand to change the salaries and description of employees’ job positions.

3.4 Training program

SKF builds the learning center system for training the employees. There are three main roles of this center.

1) Give the introduction program to the new employees
   This introduction program includes the company’s regulations, the job descriptions and individual responsibilities etc.

2) Training program
   The training program focuses on the job requirements. When a new project needs new knowledge that the employees may not master, the learning center will offer the corresponding training programs for them.

   On the other hand, the learning center also provides the training programs for the individuals who want to develop themselves in the certain field. The employees need to write the application letter and deliver it to his manager. After the manager think it
about if this development plan is suitable for this person, and then discuss with HRD to see what relevant training programs they can offer.

3) Specific team training
   This training program focuses on the team training, such as train the employees how to cooperate with each others.

3.5 Recruitment

When the organization needs the new employees, or when the new project requires new knowledge, HR department has responsibility to recruit the new employees. However, this also requires the cooperation from relevant project managers. First of all, the project managers write a profile about what kind of knowledge they need or what kind people they need in the project team, and then deliver this profile to the HR department. HR department considers two sides to recruit the new employees. One side can be called hard side, which means that HR department examines the applicants’ knowledge qualification that the project managers require. The other side is soft side, which means that HR department also considers the applicants’ personalities if they are fit for the team work.

4. The innovation process

SKF has focused on the innovation for a long time, and considered it as one of the most important competitive advantages. The approach to collect the creative idea from the employees is quite simple and efficient. Firstly the employees write a formal paper about what new the ideas are and how to do it in briefly. Then they can store this paper into a system called invention database and at the same time the paper will also be delivered to the development center within the organization. The employees of this center check if this idea has been existed and what the current situation is.

The organization also set up a committee to assess the idea in order to see its feasibility. If the committee accepts the idea, then the organization will form the project team to develop it. Sometimes the inventor may not be involved into the project team for some reasons. Of course, if the committee doesn’t accept the idea, they will also give the employees’ feedbacks why it doesn’t work. The most important norm for all the employees is the involvement into the innovation process, and to think about the creative ideas to benefit the company.

For stimulating the employees, HR department makes the relevant HRM stratetgies, such as rewarding strategy and performance measurement strategy. However, the top of mangers of SKF believes that the reward strategy is only for short term to stimulate the employees’ creativities, not for the long term.
5.2.4 Analysis Case 2 SKF

According to the description of HRM, KM and innovation in SKF, the model can be built as following.

![SKF Model Diagram](image)

**Explanation of this model:**

1. HRM has already remove the barrier of people and drive KM into the right direction
2. Patent and creative ideas are inside the overlap area, but the links between HRM and overlap area can not be sure, namely, whether HRM influences the overlap area is not clear
3. HRM influence and stimulate innovation

1. **How HRM removes the barrier?**

A few key HRM strategies and practices can remove the barriers from people and drive KM in the right direction\(^4\). SKF utilizes performance management strategy, institutionalizing learning to learn strategy and reward strategy to implement the procedure of remove.

1) **Performance management strategy**

The performance measurement is executed by the employees’ direct managers once a year, who are familiar with their own employees very well and they know clearly what the employees have been done during the last year. And 10% “move” target of every year stimulates the employees’ working enthusiasm; the employees with good performance will get promotion, in contrary, the employees with bad performance will probably be fired. The procedure of performance measurement should be fair.

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\(^4\) See chapter 4, 4.2 HRM strategies and practices in KM
and objective. This strategy overcomes the barriers about ‘no discipline to act’ and ‘motivation’, playing the role of creating a supportive environment for KM.

2) Institutionalizing learning to learn strategy

Learning in the organization can take place at three levels, individual, group and organizational levels. SKF’s strategies mostly focus on individual level and partly on organization level. The employees make their own individual development plans and are responsible for themselves. To achieve their own plans, they need to know clearly what they want to learn and put the plan into practice. Therefore, if they want to develop their careers, they can not always use the excuse, “I am too busy, I do not have time to learn”, they will always remember they are learning for themselves.

Organizational learning can be divided into two sides; one side is compelling learning, and the other side is voluntary learning. SKF offers three kinds of training programs to the employees. During the training process, the employees are forced to acquire and update the relevant knowledge for their better working performance. For voluntary learning, the company offers three approaches for employees to share their knowledge inside the company, including learn from each others, Ask SKF system, and search in the report archive. Through these three approaches, the employees can update and acquire new knowledge by themselves at any time anywhere. Knowledge sharing can make the new incomers learn faster and contribute their work much easier. By providing the training programs and knowledge sharing, SKF overcomes the barriers of ‘transferring knowledge to new people’ and ‘teaching the older employees new ideas’, and create a knowledge-conductive learning atmosphere.

3) Reward strategy

SKF uses reward system to stimulate employees’ enthusiasm of thinking and creating new ideas. These ideas are collected and evaluated by the committee regularly. After being accepted, the inventors are rewarded with salary increase, bonus or other pecuniary rewards. SKF not only rewards the people who has creative ideas and inventions, but also rewards the people with good performance of last year. Hence, this strategy encourages the employees to contribute their works, deliver better performance. HRM plays two roles in KM here; one is to create the knowledge management team, the committee, to evaluate the ideas; the other is to create a supportive environment for KM program. This strategy overcomes the barriers of ‘no motivation’, which means with the encouragement of reward, people always have motivation to think and do the things in innovative ways.

In SKF, the involvement of HRM strategies plays the supportive roles for KM. The supportive activities might include formal salary increase, the implementation of recruitment and training programs offer. The purpose for doing these HRM practices is to encourage employees’ innovativeness, help the project managers find the suitable new people with qualified knowledge, and train the employees in the certain ways. In

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See chapter 4, 4.2.2 institutionalizing learning to learn
SKF, the barriers from people are totally handled by the useful HRM strategies and drive KM into the right direction.

2. How are KM and innovation linked?

1) Knowledge Management speeds up the innovation process
   The employees’ creative ideas are collected by KM department and are assessed by committee; once the ideas are accepted, the project team will be organized and put them into practice as soon as possible. When the process of KM is identified as various activities, including knowledge creation/generation, knowledge development, knowledge distribution, knowledge evaluation and knowledge application etc, SKF implements all of these activities management internally. This complete internal KM system can speed up the whole innovation process from the ideas to real products, shorten the cyclic loop of innovation. KM in SKF provides a long-term competitive advantage in the market.

2) Knowledge distribution stimulates innovation
   The new technologies or knowledge gained from inside or outside the organization are distributed into the relevant fields by knowledge management department. Through the process of distribution, the employees can keep pace with the latest knowledge and technology even if sitting in the close lab. These new knowledge and technology might stimulate the employees to rethink the current projects and products, or create the new inventions. In short, knowledge distribution plays simulative role of improving the employees’ innovativeness, resulting in improve the whole company’s innovative competition. Hence, this practice link meets a theoretical link, ‘the activities of KM can influence the activities of innovation’.

3) Patent and creative ideas are in the overlap area formed by KM and innovation
   Creative ideas are collected by knowledge management department and stored in the invention database built for innovation management. The recognition of creative ideas can be seen as the start point of innovation process, at the same time, the collection of these ideas can be seen as the activity of knowledge creation/generation. Hence, it is not surprised that creative ideas are in the overlap area of KM and innovation.

   SKF sets up a separate patent department inside knowledge management department. The main roles of this patent department are to help the employees do the relevant research of their creative ideas, look up the relevant information, patent the ideas and keep them security inside the organization. In organizational structure, patent department is independent from knowledge management department, and belonged to its one unit. Hence, the activities of managing patent can be considered as the activities of managing knowledge. On the other hand, patent also is belonged

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6 See chapter one, 1.1.1 the definition of innovation, the cyclic loop includes recognition, initiation, implementation and stabilization.
7 See chapter two, 2.4 the activities of KM can influence the activities of innovation
to radical innovation\textsuperscript{8}, managing patent can also be considered as the management of a type of innovation. Based on these two reasons, patent should be in the overlap area formed by KM and innovation.

3. How HRM influences or stimulates innovation?

As Laursen and Foss (2003) state that ‘HRM practices influence innovation’ \textsuperscript{9}, the case of SKF also confirms this point. For instance, SKF makes use of performance management strategy (including performance-related pay and promotion regulations etc.) to stimulate the employees’ creativities. And it also builds a learning center to train the employees, which prepares the foundation for innovation. The use of these HRM practices can influence innovation performance positively inside the company. Hence in the model, HRM and innovation are linked by the solid arrow.

4. How are HRM and the overlap area linked?

In SKF the links between HRM and the overlap area are not very evident, this is the reason why the arrow from HRM and the overlap area is broken line. The links between HRM and the overlap area might start after the evaluation of ideas. By the relevant research, the ideas are evaluated by committee to see if they have feasibility to be put into practice. Once the ideas are accepted and decided to be used, the specific project team is organized as soon as possible. The selection and organization of team workers is a part responsibility of HRM, therefore, HRM could support to make these creative ideas come true. However, I did not gain enough information to support this link, so I can not conclude the link between HRM and the overlap area is represented clearly inside SKF.

\textsuperscript{8} See chapter two, 2.4 knowledge management can influence types of innovation

\textsuperscript{9} See chapter three, 3.2 HRM practices influence innovation
5.2.5 Ordina

1. Background

Ordina was founded in 1973, now it is a leading player on the market for information and communication technology. It emphatically positions itself as a partner in business and ICT issues. Currently, Ordina has a workforce of 3,600, and work for top companies and government organizations both in the Netherlands and abroad. Ordina has divided its organization into five market-based sectors, concentrating on those segments of the market in which (ordina website, about ordina):

- ICT has had and continues to have a far-reaching impact
- ICT is the locomotive of innovation
- ICT offers the clients a competitive advantage

These sectors are Finance, Utilities, Telecom & Media, Public, and Trade, Transport & Industry. The overall organizational structure is as following.
Ordina’s mission in the long run is to offer the customers strategically competitive ICT solutions, bringing together business operations, management, people and information technology. Ordina supplies a combination of (Ordina web site, about ordina, introduction):

- Management consultancy
- Architecture and design
- Software development
- Network and infrastructure
- Operation and management

Ordina is different from the traditional companies. It does not produce any real traditional products for sale; instead the only product of Ordina is people. Ordina lend its people to the other companies to building the IT systems or giving them the IT solutions, in the
other words; the company takes use of the employees’ knowledge to earn the profits in the market. Hence, Ordina’s organization structure is different from the companies focusing on R&D field, it does not have knowledge management department separately and no real R&D department either. There is a location unit in every section, which is responsible for rearranging the employees according to the requirements of projects. As different projects require different working languages and different methods to build the systems, the professional employees also need to be rearranged when every project is launched. These location units communicate with each other and adjust the employees according to their own working schedule. This organization structure gives the employees’ work more flexibility and challenges, not always stick into one section or one direction.

2. KM in Ordina

The approaches of managing the activities of knowledge management are comparatively simple in Ordina.

2.1 Knowledge storage

After the employees enter the company, they are required to write their own profiles including what IT knowledge they master and what the other skills they have. These knowledge profiles are stored in a database that can be accessed by every location unit of each section. When a new project starts, the location units search in the database to look for the suitable employees.

2.2 Acquiring and Updating the knowledge

In the IT field, the languages of programs and technology change so fast, this requires the employees to keep learning to update their knowledge regularly. Ordina offers the training programs to the employees and selects the training programs according to the direction of IT development. For instance, if in the market the Java language becomes more popular than the others, the organization will choose some employees to study Java language, and then the number of employees who master Java language will be increased. But, Ordina does not have its own independent training center, usually, it cooperates with dependent commercial training centers and sends the trainees there. By the participation of training program, the employees acquire and update knowledge regularly.

The build of partnership system is the other way to acquire and update knowledge for some qualified employees. Partnership system has different meaning in Ordina from the traditional meaning. These qualified employees can acquire knowledge from the company’s literature database. The appraisal of this kind of employees is based on some certain levels of requirements in knowledge skills, namely, if an employee achieves these requirements, he can become a partner of Ordina, and has access to enter the literature database to search the literatures. In addition, as a partner, the employee can get the supports from all the sections when he meets problems. Right now, only about 20 employees gain this honor.
2.3 Sharing the knowledge and experiences

Actually, in Ordina there are no any center systems to support whole organization’s knowledge management. The approach to share knowledge and employees’ past experiences primarily depends on the traditional way, namely, the employees’ connection network. It means that if the employee knows many colleagues inside the organization, it must be much easier to gain useful information or knowledge from these colleagues than the employees who do not know many people. In fact, the employees can get their colleagues’ contact information by searching yellow page. But most employees only put their telephone number, email address and job position information on the yellow page, most descriptions of their knowledge and past experiences are absent. Hence, in Ordina the best approach of sharing the knowledge and experiences is the use of informal employees’ contact network.

These knowledge management activities are implemented inside every section. The main responsibility for managing and implementing these activities is charged by the director of every section. Due to no center knowledge management system, the management of knowledge activities is penetrated into human resource management, namely, the approaches of managing employees are considered as the approaches to manage knowledge activities. To conclude, Ordina does not have a complete and independent knowledge management.

3. HRM in Ordina

In Ordina the main statement of HRM is ‘investing in people’. Ordina wishes to stand out as a quality employer by offering a combination of high job satisfaction to all of employees, an interest in and a commitment to the human aspect, an informal corporate culture and outstanding career opportunities. The aim to invest in people is to improve the people’s competence, which has been regarded as one of the organization’s highest priorities (Ordina web site, about Orinda, mission statement)

3.1 Human resource management structure

Actually, when a company thinks about developing its IT system, firstly, it considers its business’ needs, namely, what IT programs can bring to the company and what kind of IT programs is suitable for it. They might have their own plans how to do it, but they need IT people to implement its business plan. Or they do not know how to solve some business problems with the help of IT programs, then they might not only need the IT people, but also need the perfect IT solutions first. Hence, Ordina divided its departments into two parts: business enterprise solutions and IT solutions. The employees working in the business enterprise part talk with the clients directly and discuss the details of IT programs including the work language and the type of program etc., in contrary, the employees working in the IT solution part identifies the required knowledge for IT programs firstly, then deliver the knowledge list to the location unit of each section. The location unit will select the employees inside the section according to their professional knowledge and their working schedules. In another words, the employees do not have fix
the section working for, the location units rearrange all the employees according to the projects and their schedules. However, the company will not force the employees to do the fields they might not like or not be familiar with; they can make their own choice, the direction of business field or IT field.

3.2 Performance measurement

Each section sets up the function profile which can be seen as the detail requirements of promotion to assess the employees’ performances. When the employees’ performances achieve most of the requirements of promotion written in function profile, they will be promoted upon to the new position. The performance appraisals are from different angels, such as from clients, the colleagues and the direct managers. HR department does not really involve into the assessment procedure, normally, it is only responsible for making the physical contracts with employees and outline of promotion’s requirements.

3.3 Training program

As mentioned above, Ordina offers the training programs to employees. Deciding who needs to be trained depends on two sides considerations: one is from the employees’ individual development plan, including what knowledge the employees are interested in and what direction they want to develop their careers; the other side is from the directors’ and project managers’ considerations. The directors are responsible for investigating the market change as well as technology development; on the other side, they knew their employees more who will be possible to suitable for taking the certain training programs. Hence, sometimes, the selection of trainees is decided by them.

3.4 Reward

There are a few approaches to stimulate the employees inside the organization, such as salary increase, bonus and rewards. At the end of year the performance evaluation is taken in the whole organization, and it is closely related with the employees’ salary levels. The better performance evaluation is, the more salary will be increased. The company executes the performance-related pay regulation. The company also makes the bonus regulations, such as vacations with payment and stocks. During the process of stimulating the employees, HR department plays the role of an accountant, adjusting the salary according to the performance reports from each section, and confirming the rewards and bonus.

3.5 Recruitment

HR department has the most responsibility to recruit new employees. Once the new employees are needed for the company’s development, the managers of ever section firstly identify knowledge and employees they may need, and then write the requirement profiles to HR department. The HR department shops the employees in the market according to these profiles. And the resumes are sent to the desk of director of sections, and the directors select the possible people based on their knowledge background. After
the first round selection, the directors and relevant project managers also interview the applicants in the list, in order to see if the employees’ personalities. HR department is informed after the decisions of recruitment are made, and asked to take care of contracts work. The clear procedure can be illustrated in Figure 12.

4. The Innovation process

Due to the characteristics of Ordina, there are not many innovations inside the company. However, the company builds the mailbox for collecting the employees’ creative ideas, including the advices for organization’s development, the new ways about IT solution, and the suggestions of company’s management etc. Every month, these ideas are evaluated in the company’s meeting. And if the ideas are accepted, the employees can get the rewards for that. I did not get more information about innovation of Ordina, which is all about it.
5.2.6 Analysis Case 3 Oridna

According to the collected information from interview of Ordina, the links’ model can be illustrated as figure 12.

![Figure 12: Ordina model](image)

Explanation of this model:

1. HRM has not removed the barriers of people for KM, and drive KM in the right direction, or in short, KM is not supported by HRM removing the barrier of people directly. This is the reason why the arrow from people to KM is broken line.
2. The links between HRM and the overlap area can not be sure, namely, whether HRM influences the overlap area or not is not clear
3. HRM stimulates innovation

1. Why HRM has not removed the barrier of people?

As concluded above, KM is penetrated into HRM, and the approaches of managing employees are considered as the approaches to manage knowledge activities in Ordina. However, most of these HRM practices do not aim to achieve better knowledge management performance, but to complete HRM performance. It means that Ordina does not consider taking advantage of HRM strategies and practices to influence and support KM. However, these HRM strategies and practices still established the foundations of launching KM.

1.1 The aims of HRM practices are not for KM

1) Performance measurement
Ordina uses 360 degree appraisal to measure the employees’ performance, which can ensure the outcome of appraisal’s fairness and openness. The performance measurement strategy is one of the key difficult-to-imitate competitive strategies with in the domain of HRM\textsuperscript{10}, therefore, if Ordina can make use of the performance measurement strategy to stimulate the employees’ motivation to care about knowledge management activities, then this strategy can create a supportive environment for KM programs.

2) Reward management
Inside the Ordina, there are also some rewarding regulations. The uses of performance-related pay and bonus are to encourage the employees to contribute their works and create the most profit for the company. But it does not aim to stimulate the employees’ creativities and achieve better knowledge management performance. If Ordina can connect the rewarding regulations with the activities of knowledge sharing, knowledge update and knowledge acquirement, it can use this strategy to remove barrier of ‘motivation’ and drive knowledge management in the right direction.

1.2 Uncompleted KM

It seems that Ordina does not pay much attention to KM and does not build a complete KM system. Even if, currently, there are four approaches to manage the knowledge, but there are still have shortcoming for completing KM process. Firstly, there is no center KM system on purpose for managing the employees’ professional knowledge and past experiences. Most of employees’ knowledge profiles put in the yellow page only provide the contact information; hence, it will be hard to find the right person to ask the relevant knowledge.

Secondly, Ordina does not have its own training center, so all the training programs are outsourced to the external commercial training centers. Although this way might save the money for Ordina, it also brings some disadvantages, such as no pertinence for certain project and no supervisions to employees. Moreover, the selection procedure of trainees is short of fairness and openness due to the directors’ individual subjectivities. All these disadvantages can kill the employees’ initiative for KM.

Thirdly, the approach of sharing knowledge still heavily depends on traditional contact relationship, which results in blocking knowledge transfer to new incomers. Despite Ordina builds partnership system, few people have access to the database for searching relevant literatures and reports. It means the knowledge and information are not totally shared in the whole company, resulting in uncompleted knowledge management.

From analysis of HRM and KM in Ordina, it can be concluded that there is no clear clues to indicate HRM influences KM by removing the barriers from people category. Hence, in the model, this is a reason why the arrow from people to KM is broken line.

\textsuperscript{10} See chapter 4, 4.4.2.5 performance management
2. **How are KM and innovation linked?**

As one of project managers of Ordina said, Ordina does not have real R&D department focusing on products’ research and development. Due to the organization’s business direction, Ordina does not focus too much on innovation field, and is not considered innovation as long term competitive advantage. On the other side, due to the company’s uncompleted KM, it is hard to find any practical links between KM and innovation except for theoretical overlap area.

3. **How HRM stimulate innovation?**

As mentioned above, HRM in Ordina is responsible for collecting the advices for organization’s development, the new ways of IT solutions, and the suggestions of company’s management from employees, and evaluating them, rewarding them. By the use of this strategy, the employees are encouraged to consider the company as its own business and work for it. This contribution can improve the company’s profitability and innovativeness in the long run.
Chapter Six

Final model, Recommendations and Conclusion

This chapter will focus on building the final model by combining the refined model, SKF model and Ordina model and explaining in brief. Then the recommendations for high-tech company about how to organize HRM, KM and innovation are introduced by understanding the theoretical links and practical situations. This thesis does not cover all the aspects about HRM, KM and innovation, the further discussion are also needed in the future research. Finally, the final conclusion will be given to be an end of this thesis.

6.1 Final model

By combining the refined model, SKF model and Oridna model, the final model can be illustrated in figure 13.

![Figure 13: Final model](image)

Explanation of final model

1. HRM removes the barriers of people, and drive KM into the right direction
2. HRM influences or supports the overlap area
3. HRM influences and stimulates innovation

6.1.1 Reasons for final model

1. In this model the human resource management is placed on the bottom as the main body to drive knowledge management and influence innovation
People can create knowledge and use it to invent new products and add values for the companies. The final aim of managing people’s knowledge in the company is to improve the company’s capability, performance, profitability and competitiveness in the long run. During the process of managing people’s knowledge, to some extent, people can also be considered as one of major categories of knowledge barriers. However, the managers use HRM strategies and practices to remove this barrier, and achieve the goal of managing knowledge and drive it in the right direction.

2. KM and innovation are overlapped and influenced by HRM

One of the theoretical links between KM and innovation is that they are found on the same elements-employees’ experience and knowledge facts. Due to these two same elements, there must be somewhere overlapped in KM and innovation fields. Patent can be an example to explain what might be in this overlap area. In SKF, patent management is directly belonged to one of part of KM, considered as a process of knowledge creation and knowledge development. On the other hand, patent is also a type of radical innovation. Hence, it can be regarded as one element existed in the overlap area. As Lenard (1995) and Dougherty (1996) present, focusing on both of the concepts of innovation and KM as activities imply that in the overlap area innovation process can be managed as knowledge work, which can also improve when the company contributes on developing a rich, activity-based conception of KM, it also can stimulate and develop innovation to small extent.

In addition, creative ideas can also be seen as one of the elements existed in overlap area. The start point of the process of innovation can be considered as the recognition of creative ideas, which establishes the foundation of innovation to possess creativity in thinking and doing things. On the other side, the process of creating new ideas also can be seen as the process of knowledge creation / generation. Hence, the approaches of managing these creative ideas can be treated as a part of knowledge management or a part of innovation management.

3. HRM influences and stimulates innovation

As Merx-Chermin Oce and Nijhof (2005) state that creativity is often seen as a personal asset and in many cases it is. For organizational innovation, however, it is not enough when every employee as such wants to be creative. Creativity should be perceived as a collective process to raise the level of innovation potential of the organization. But how to stimulate the people’s creativities is the main problem that the HRM managers are facing now. Currently, HRM managers are trying to make use of HRM practices package (including reward, performance measurement and build the creative teams)\(^{11}\) to stimulate the employees’ passions of creativity. By the use of this strategy, the company’s innovativeness can be improved and gain the better innovation performance indirectly. Adair (1990) also suggests this strategy in his book, ‘The Challenge of Innovation’. Stimulating the diversity is an approach to

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\(^{11}\) See chapter 3, 3.2 creativity as a medium between HRM and innovation
influence innovation as well. Integrating the different viewpoints and various knowledge provides the rich resources for rethinking the current projects and product. As one of the inputs of innovation, the strategy of diversity has already attracted the HR managers’ interests in the last few years.

6.2 Recommendations for high-tech companies

Chapter two, three and four elaborate the theoretical links between KM and innovation, HRM and innovation, and HRM and KM. Combing the understanding of these theoretical links with the analysis of HP case, the refined model is built in the chapter five. Based on this refined model, the practice models of SKF and Ordina are analyzed and checked if it meets the theory. The results indicate that HRM, KM and innovation in SKF are organized by meeting most of theoretical links, while the situation in Ordina is not positive. According to my understanding of the relationships among HRM, KM and innovation, there are a few recommendations for high-tech companies.

First of all, high-tech company should pay much attention to human resource management and make use of it to support KM and innovation.

1. Utilizing HRM strategies and practices to remove the barriers and drive KM into the right direction
   These strategies can include trust HR philosophy strategy, institutionalizing learning to learn strategy, creating knowledge-oriented HR system strategy, recruitment and retention strategy, performance management strategy, and reward management strategy. The use of these strategies correctly and purposefully can remove the barriers for KM and drive KM into the right direction. It is obvious that the effects of using the package of these strategies are better than only using one of them.

2. Utilizing HRM practices package to stimulate innovation and improve innovation performance indirectly
   These practices can include reward, training, building the creative teams and appraisal the creative performance. The reason why use the HRM practices instead of HRM strategies is because that HRM practices can be seen as a routine in the company, which can create a new culture and environment for stimulating innovation in the company. And the effects of using the HRM practices package are strong positive than only using one of HRM practice.

3. Managing creative ideas and patents by using the same approaches and strategies
   As concluded that creative ideas and patents are two of the elements existed in overlap area, and in this area, KM and innovation management can share one management system. The purpose for doing this is to avoid wasting the company’s resources and saving time.
6.3 Further discussion

This thesis focuses on answering the two questions about how HRM, KM and innovation are theoretically linked and how HRM and KM influence innovation in high-tech company. During the research, I found there are too many concepts and opinions from different perspectives in these fields. I can not cover all of them and explain everything, which will throw me and reader into a huge information database. Even if many researchers state their opinions and their results in the literatures, I still could not find one literature that builds one complete model for integrating all these links directly and analyzes about it. It implies that in this research field there are still some further discussions and studies needed continuing. The main research topics can be stated as following:

1. What elements do actually exist in the overlap area formed by KM and innovation, and how does a high-tech company manage the overlap area?
2. What can be called a completed knowledge management system, and how to assess it?
3. To possess a completed knowledge management system, what can HRM do during the management process?

These questions are required to be taken into account by HRM and KM managers of high-tech company when they are trying to take advantage of knowledge to gain more profits in the market. Due to time limitation and topic focusing, my research can only end with answering two questions stated in my thesis. The more researches about questions put forward above will also help the managers understand and manage the relationships among HRM, KM and innovation, integrate them and achieve better competitive advantages for their companies in the long run.
6.4 Final Conclusion

This thesis research can get a few final conclusions:

1. HRM strategies and practices can help KM to remove the barriers from people category.
2. KM and innovation are overlap and form a black area, in this area, the approaches of managing patent and creative ideas can be considered as both KM and innovation management activities.
3. HRM strategies and practices stimulate innovation indirectly

In my opinion, HRM is a driver for KM and an engine for innovation. It drives KM into the right direction, and during this process plays a various roles to support or implement KM programs. On the other side, HRM combines HRM practices with purposeful strategies to stimulate the employees’ creativities and diversities, resulting in improvement the innovation performance indirectly. Hence, it can be regarded as an engine for start innovation process management.
Reference

2. Armstrong, M. (2000), the name has changed but has the game remained the same?, employee relations, Vol. 22 NO. 6, pp. 576-93


25. **Jenny Darroch (2002),** examining the link between knowledge management practices and types of innovation, Journal of intellectual capital, Vol. 3 No.3, pp 210-222


27. **Jose´ L. Gasco´, Juan Llopis and M. Reyes Gonza´lez (2004),** The use of information technology in training human resources An e learning case study Journal of European Industrial Training Vol. 28 No. 5, 2004 pp. 370-382


38. Michael Albert and Thierry Picq (2004), Knowledge-based organizations: perspectives from San Francisco Bay area companies, European Journal of Innovation Management Volume 7 · Number 3 · 2004 · pp. 169-177
42. Mohan Thite (2004), Strategic positioning of HRM in knowledge-based organizations, The Learning Organization Vol. 11 No. 1, pp. 28-44
44. Nada K. Kakabadse*, Alexander Kouzmin and Andrew Kakabadse (2001), From Tacit Knowledge to Knowledge Management: Leveraging Invisible Assets Knowledge and Process Management Volume 8 Number 3 pp 137–154
54. Scarletrough, Harry (2003), knowledge management, HRM and the innovation process International journal of manpower; Volume 24 No. 5 pp 501-516
57. Scott Williams (2001), increasing employees’ creativity by training their managers, industrial and commercial training, Volume 33. Number 2 pp 63-68
61. Todd Dewett (2004), Employee creativity and the role of risk, European Journal of Innovation Management Volume 7 · Number 4 · 2004 · pp. 257-266
62. West, M. A. and Farr, J. (1990), Innovation and Creativity at work, Wiley, Chichester
63. Williams, A. (1999), Creativity, Invention and Innovation, Allen & Unwin, Sydney

65. Internet Resource:
SKF website, Board and management: 
http://www.skf.com/portal/skf/home/about?contentId=000676&lang=en#, 16/06/2005
SKF website, Knowledge definition: 
http://www SKF.com/portal/skf/home/careers?paf_dm=shared&paf_gear_id=3900004&contentId=082398&action=viewDetail&lang=en, 16/06/2005
Ordina website, about Orindna, introduction: 
http://www.ordina.nl/p_proza.asp?PageId=72&SectionID=6, 16/06/2005
Ordina website, about Orindna, mission statement: 
http://www.ordina.nl/p_proza.asp?PageId=73&SectionId=6, 16/06/2005